COAL AGE

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The Long-Suffering Salaried Man

IN this day and time, when the railroad employees, miners and organized trades in general are demanding and receiving increases in wages ranging from 10 to 40 per cent., we wish to present a plea for the salaried man.

Salaried men at coal mines, especially mine foremen, have not as a rule gained such recognition from their companies in a financial way as their efforts entitle them to receive.

In the majority of instances around coal operations, he is an executive having more or less responsibility and must act as a shock absorber between his boss and his workmen. Generally, he goes unnoticed so long as the weather is fair, but when a storm breaks he is the first one called upon to show cause.

He is always on the job, for in his case there isn't any such thing as an 8-hr. day or pay for overtime. Nights and Sundays he labors without complaint, often working with some of his assistants and subordinates, whose wages exceed his own salary.

It is a well-known fact that many miners and machine men receive greater pay than the mine foreman, though they work less time, with little mental effort and no serious responsibility.

The salaried man does not belong to a union and is in no position to demand an increase. Generally, he must rely on his employer's sense of justice, and it only too frequently occurs that his sole reward for patience and earnest effort is bitter disappointment.

In the last year, living expenses have advanced greatly, and it is no more than right that salaries should be increased accordingly. It would be well for the employer to bear in mind that a voluntary increase in salary makes for loyalty and satisfaction that do not result so readily when the employee is obliged to ask for the favor.

Ever so many of life's necessities have gone up for keeps. The war's end may bring recessions, but hundreds of commodities will not return to former price levels. Even the coal industry may not again be afflicted with a case of "dumps." Let us be decent to the fellows who have stood the test of service when the atmosphere was so blue that the sun couldn't shine through it.

Ideas and Suggestions

A Parable for Coal Men

Many great and wise deeds are never mirrored to the public gaze. Goodness generally cloaks itself in modesty, while evil shrieks noisily from the housetops. As an instance of this, let me cite the case of the King of Ingenstans, which bears out concisely the observation just made.

The history of Ingenstans is unimportant. It was a small principality, densely populated. However, there was one feature about Ingenstans that distinguished it from the neighboring kingdoms. This feature was that over one-half the entire population was engaged in the manufacture of a certain product. In turn, this national product was dependent upon a certain ingredient that could only be obtained from underground. The entire welfare of the country was therefore subservient to the mining industry.

There came a time when the general affairs of the Ingenstans became greatly unsettled by the war of two large neighboring states. Like giant gadflies these two warring factions drained the Ingenstans of all available foodstuffs and manufactures.

The result was inevitable. The miners deserted, and an acute shortage of labor resulted. The transportation facilities became congested with freight consigned to the warring states, and traffic increased. New business enterprises sprung up like mushrooms to supply the great demand for war materials. New fields for labor, at high wages, were thus created, and also added consumers of the mining product. The consequence was a falling off of the mining product that constituted the foundation of the principality's industries.

Things became really serious. Manufacturers, spurred on by the hope of making sudden fortunes, wildly clamored for more and more of this essential product. Dealers of all classes rent the air with cries about the terrible state of affairs. Finally the people, alarmed by the hysterical rantings of the town criers, were aroused to such a point that the matter was brought to the King's attention.

Now the King of Ingenstans was a shrewed, cool-headed man. He called into conference the proprietors and managers of the mines and listened intently to the excuses and remedies they suggested. Then he arose and said:

"Gentlemen, the causes of the present shortage in your product seem natural and unavoidable. Like you, I can see no remedy that will solve the matter satisfactorily and for all time. However, I believe that I can help the situation materially. At nine, tomorrow, I shall issue a command to all my town-criers that on penalty of death no word as to the state of the shortage existing in your production shall be uttered by them until I so command. In this way I hope to prevent people of ample means from laying in large quantities of this product for storage, while people of small means are denied the product entirely or else are forced to pay exorbitant prices for it.

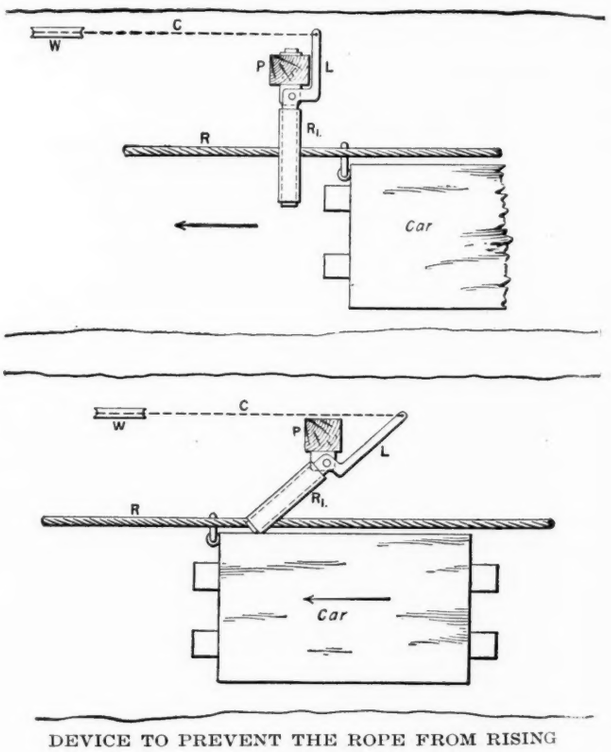
"Further, I believe that if the consumers are not alarmed by exaggerated accounts of severe shortages they will get along with a more normal and constant demand, which will not tax you beyond your present producing capacities. This will enable you to gradually increase your facilities of production to meet the unusual demand."

The next day the King's command was received and executed by the town-criers.

Gradually the outbursts of the people subsided. Manufacturers became less insistent in their demands, and affairs returned to a normal state.

Trouble Saver on Rope Haulage

On a side-rope haulage trouble developed wherever a slight hollow in the road was reached through the stress of the rope pulling it out of the jiggers on the cars. When this happened where the cars were far apart it had the effect of leaving one particular car standing on the track. The following one was quite liable to push it off the track,



DEVICE TO PREVENT THE ROPE FROM RISING

causing a wreck. Sometimes five or six cars would get piled up together before the haulagemen could find out where the trouble was.

As a means of obviating this difficulty the small appliance shown in the accompanying illustration was erected. The upper drawing shows a car approaching the appliance and the lower one the car passing and deflecting the arm.

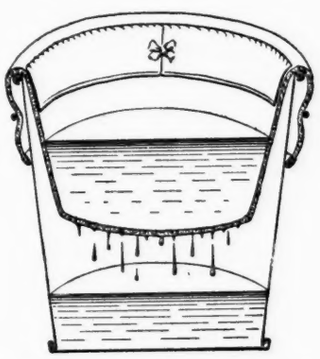
Post *P*, a strong one, has bolted to it a lever *L*, one arm of which projects behind the post, and the other in front of it and at least 6 in. beyond the line of the rope and 3

to 4 in. higher than its normal position. The front arm has a piece of pipe R_1 fastened to it, which serves as a roller when the rope is running up against the arm. Attached to the arm at the rear of the post is a chain C which passes over the wheel W and is attached to a counterbalancing weight.

In operation the arm R_1 projects over the running rope and prevents it from rising above the limit fixed. It does this without putting any perceptible stress on the working of the haulage. An approaching car pushes the arm aside, but the counterbalance exerting itself tends to draw the lever back, keeping the arm tight against the side of the car and above the rope. As soon as the car has passed the arm springs out into its original position.

Oil Filter for a Small Plant

A tin can and a felt hat combined, as shown in the illustration, says Jan Spaander in *Power,* make a first-rate and inexpensive filter for oil, in a plant that does not



OIL FILTERED THROUGH A FELT HAT

justify the purchase of an expensive apparatus. If there are holes in the top of hat, pieces of felt (taken from the brim) can be stitched over them.

A Place in the Sun for Contributors

By Canadian Engineer

This is an idea that is placed before *Coal Age* and its readers as a means of bringing those who read the paper and those who write for it closer together.

How would it do to have an annual vote upon the best paper published during the current year? This would be decided by the ballots of all the regular subscribers. Divide the articles into various classes, say purely technical (perhaps several groups), sociological, descriptive, commercial, etc., each reader having one vote in each class. In order to cut down the amount of labor, a selection of articles could be made when they are published as being of sufficient merit in the eyes of the editor to be voted on later. The fact that such an article has been selected would be indicated at the time of its appearance by a footnote or an editorial note. This would set up a preliminary standard of excellence and would eliminate long lists of votes upon articles that would not rise to the level desired.

The final result would be a list of papers of outstanding merit in the year's work, papers that in their small way might be described as marking distinct phases of mining progress. At the end of the year place a leaflet, or leaflets, in an issue of *Coal Age* with coupons printed thereon giving the lists of articles to be voted on, and each consecutively numbered in its respective class.

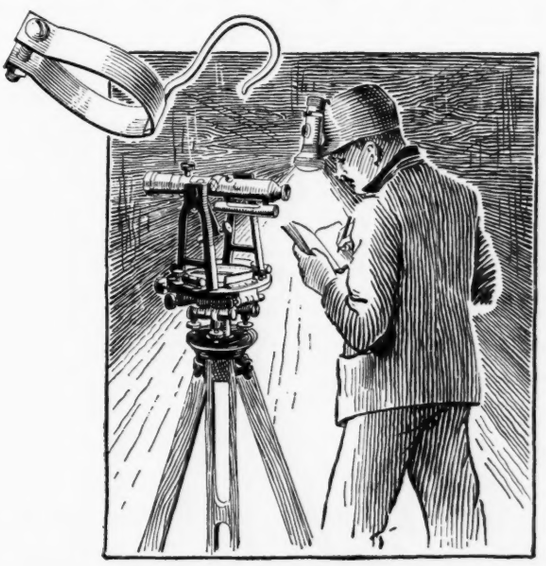
To add some interest to the results obtain a photograph and some particulars of the winner in each division, and publish that in the journal. Doing so would give all the contributors something special to strive for, would help along the reputation of the winners, and would interest the coal-mining public in the men who are helping in the literary branch of the industry. In addition to that, let the editor select one or two special subjects and have the winners of the different sections compete upon that subject to gain the prize essay of the year. Some of these special efforts could be published later.

Perhaps some interested and wealthy mining man might back up the idea and go the length of presenting a special prize or medal to be called the *Coal Age* Prize. If a sufficiently high standard of attainment were demanded, it would speedily be considered an honor to have this prize conferred. It would in fact take the place of the special medals and prizes presented in the engineering world by some of the engineering societies in America and to a greater extent in Europe.

[The above suggestion contains a number of good ideas. We would like to hear further from our readers on the subject. *Coal Age* desires that as far as possible, its general policy be determined by the coal-mining men who consistently read its pages.—Editor]

Handy Flashlight Clamp

The accompanying illustration shows a clamp for a flashlight. This clamp was made so as to be able to take notes and also for use in setting up a transit in a mine where safety lamps are required. It is handy and



THE CLAMP AND ITS USE

useful and is recommended to mining engineers as well as to inspectors.

The flashlight can be hung on the cap or clothing. The clamp is made of tin ½ in. wide with a small bolt or screw for clamping, and a hook from an old oil pit lamp. This hook is soldered on underneath the clamp.

Coal-Face Conveyors Employed in the United Kingdom--II

By Sydney F. Walker*

SYNOPSIS—The conveying belt, the jigging, or shaking trough, the traveling trough and the troughless chain conveyor are all described in this article. The traveling trough probably requires as little head room and is consequently as well adapted to thin coal beds as any conveyor now in use. Its operation, however, is intermittent.

The "Meco" conveyor is another example of the endless-belt principle. A cotton belt is used. This is usually ⅜ in. thick and 20 in. broad, with hardened surfaces and edges. The belt is supported at the driving end by a

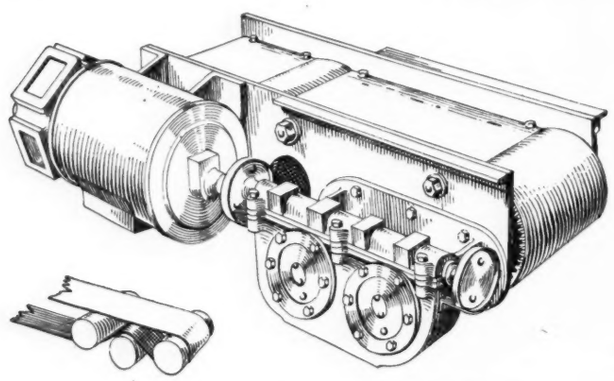


FIG. 13. DRIVING END OF MECO CONVEYOR

system of pulleys similar to that employed in the Sutcliffe, the belt being carried around two pulleys that receive power from the electric motor or engine and around an idle or jockey pulley as shown in Fig. 13.

At the other end the belt passes over a tightening pulley which is attached to a prop in the usual way. The belt runs on rollers which consist usually of lengths cut from pit props, with spikes driven into each end.

The following is a typical case of the use of the Meco conveyor. It is employed in a seam 2 ft. in thickness at the Wharncliffe Silkstone Colliery in West Yorkshire. The coal face is 160 yd. long, divided into two lengths of 80 yd. each and each served by a Meco belt conveyor, the two delivering into mine cars in a central gate road. The conveyors are worked alternately. They are driven by 8-hp. electric motors, and arrangement is made to drive the belt either to the right or the left. The driving drum projects well over the gate roads, so that the coal is delivered into the mine car by merely tumbling over the end in the usual way.

The shaker conveyor is a development partly of the jigging screen that has been long in use in the United Kingdom for separating different sizes of coal and partly of the swinging conveyor that was introduced a good many years ago. Perhaps a short description of the swinging conveyor will enable the working of the shaker conveyor to be more easily understood.

The swinging conveyor consists of an open trough of whatever length may be desired to transmit material of all kinds from point to point. The trough is either suspended from above or supported from below by inclined elastic supports. It is the inclination of the supports and their elasticity which enables the required motion to be given to the trough and to the material it is transporting. The trough is moved backward bodily at regular intervals, and after the backward motion it is shot suddenly forward. It is claimed that little power is required to drive the trough—that is, to impart the jigging motion—and that the material to be transported travels with great rapidity.

The jigging motion is imparted to the conveyor by either a reciprocating engine turning a crank to which a flywheel is attached or by an electric motor the shaft of which is arranged to drive a crank with a flywheel on the end of the shaft. The reciprocating motion is the active agent in transporting the material upon the bottom of the trough. Figs. 14 and 15 show a Zimmer conveyor.

A typical jigging apparatus is that made by Mavor & Coulson, of Glasgow. It consists of a number of troughs each 9 ft. long connected together to form the required length for the working face. The troughs are provided with stiffening plates at their ends, as shown in Fig. 16, so that it is claimed the joints not only provide a continuous trough, but strengthen the sections in a vertical direction and prevent their sagging. It is claimed also that a certain amount of curvature can be given to the conveyor so that it can work along a coal face that is not absolutely straight. It may be mentioned incidentally that nearly all the makers of coal-face conveyors advance this claim. The troughs rest on wheels which work between two sets of angle irons, one set being attached to the troughs and the other built into a light frame resting on the floor. The wheels, which are similar to those employed on mine cars except that they have no flange, take the place of the elastic supports of the swinging conveyor described above. The conveyor trough rolls to and fro upon the rollers in place of swinging upon supports from above or below.

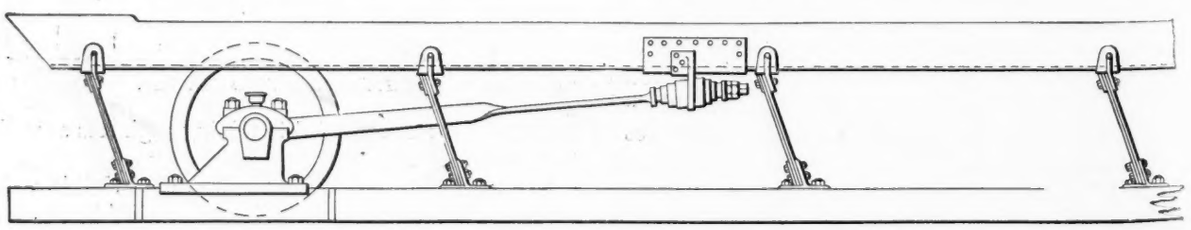


FIG. 14. ARRANGEMENT OF ZIMMER SWINGING CONVEYOR

*Alexandra Park, Bath, England.

The two wheels are held together by an axle passing under the trough.

When in operation the trough is usually fixed with a slight inclination toward the gate road, as shown in Fig. 17. It runs uphill on the backstroke and downhill on the forward stroke. On the backstroke the conveyor slides from under the coal it is carrying, while on the forward

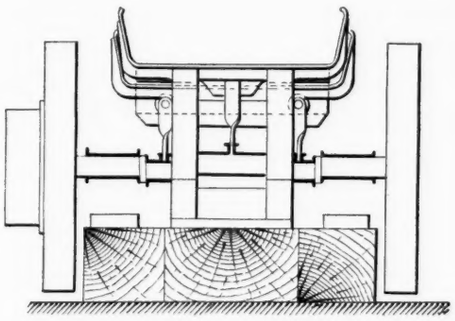


FIG. 15. CROSS-SECTION OF ZIMMER CONVEYOR

stroke it carries the coal with it. Motion is given to the trough by a rocking arm, which can be worked either by an electric motor or a compressed-air engine. The rocking arm is held upon a telescopic post, as shown in Fig. 18, the telescopic arrangement enabling the post to be fixed in any road up to a certain height; the rocking arm being held firmly upon the post when the inner sliding part of the post has been pushed firmly against the roof and clamped tightly in position.

The compressed-air engine employed with the Mavor & Coulson apparatus consists of a single-acting single cylinder arranged to work with a pressure of 40 to 50 lb. per sq.in. The cylinder can be regulated for lower pressures by removing a liner. The pressure of compressed air available at the face of the coal varies considerably, and provision is made to vary the area of the cylinder with the varying pressure. Where high pressures are available the engine is fitted with a smaller cylinder.

A crosshead is attached to the piston rod of the Mavor & Coulson compressed-air engine, the rocking lever which actuates the conveyor being attached to the crosshead. A crosshead is also provided at the opposite end of the compressed-air cylinder, the two crossheads being connected together by side rods. When the conveyor is worked by compressed air the motor is fixed alongside the conveyor trough at any convenient part of its length. It is moved forward with the conveyor as the face moves forward. The reciprocating motion is obtained directly from the piston of the compressed-air cylinder.

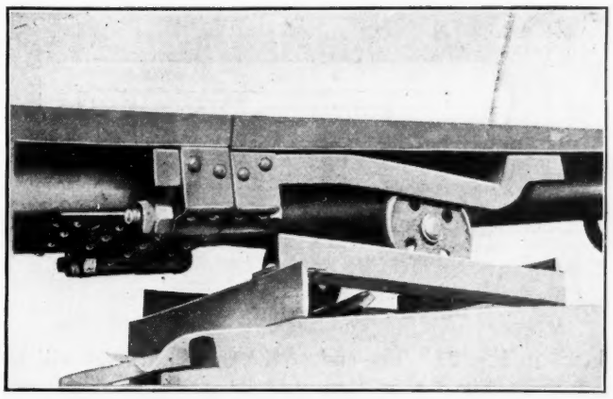


FIG. 16. ENDS OF ADJACENT TROUGHS OF MAVOR & COULSON'S CONVEYOR

When an electric motor is employed the rotory motion of the armature has to be converted to reciprocating motion, and therefore its axle is geared to a crank. From this a rope transmits the reciprocating motion to the rocking arm, as shown in Figs. 18 and 19.

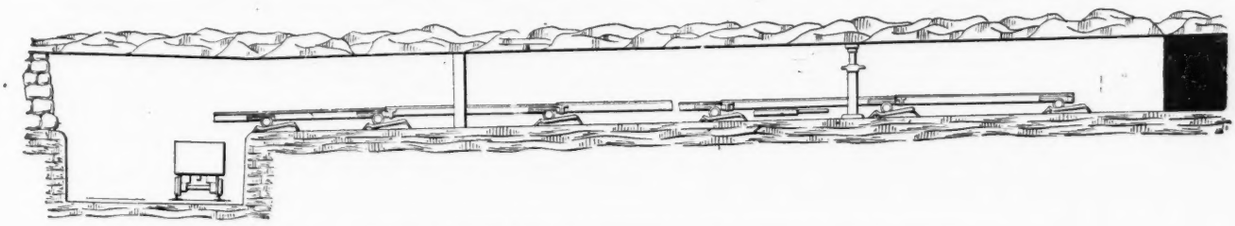


FIG. 17. MAVOR & COULSON'S CONVEYOR IN POSITION AT GATE ROAD

When an electric motor is used it is fixed in a gate road, either in the center or at the top, as shown in Fig. 19, and is moved forward periodically as the face advances, usually at intervals of 30 to 50 yd. The makers prefer that the driving apparatus shall be placed nearer the center than the top, as it is more suited to withstand tensile than compressive stresses.

Another conveyor on the jigger system is shown in Figs. 20 and 21. It differs slightly from the Mavor & Coulson, though the principle is much the same. The trough runs on wheels and the wheels run between angle irons, as

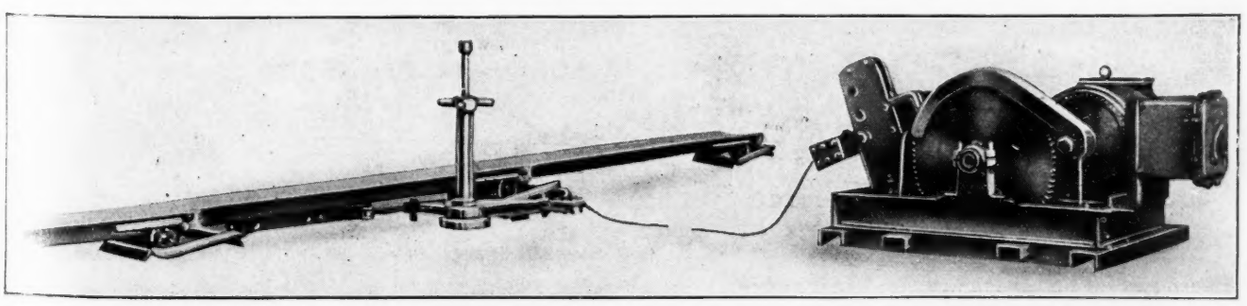
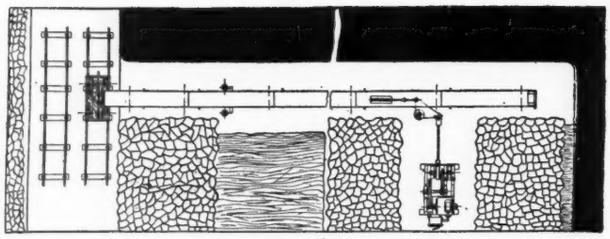


FIG. 18. CONVEYOR WITH ELECTRIC DRIVING GEAR



PLAN OF CONVEYOR FACE AND LOADING ROAD.

FIG. 19. MAVOR & COULSON'S SHAKER CONVEYOR DRIVEN BY ELECTRIC MOTOR

shown in Fig. 21. The end of the trough also, as will be seen from Fig. 20, is suspended by a chain. The compressed-air motor is built on much the same lines as that of the Mavor & Coulson, but the side rods connecting the two crossheads have two spiral springs whose tension can be regulated to meet variations in the air pressure. The arrangement for jigging the trough is the same as with the Mavor & Coulson. There is a rocking arm consisting of a bent lever, one end of which is attached to the trough and the other end either to the crosshead of the compressed-air motor or to the rope attached to the crankshaft of the electric motor. It is known as the Eichoff.

The moving trough conveyor is a further development of the trough system. There are at present two forms of moving trough conveyor on the market in the United Kingdom—the Thomson, principally employed in Scottish mines, made by Anderson & Boyes, of Motherwell, near Glasgow, and the Bridgewater, made by the Diamond Coal Cutter Co. The Bridgewater apparatus has been worked out, I understand, by the engineering staff of one of the Bridgewater collieries in Lancashire.

The two systems have several points in common. With both of them delivery of the coal is arranged at a central gate road in the middle of the working face, as shown in Figs. 22 and 23. In each also this gate road is double-tracked, and flat sheets are provided at the point where the coal is delivered, so that the cars can be transferred from the empty to the full road. With each form also there is a light bridge spanning the gate road, and the coal is delivered into the mine cars, or "hutches," as they are called in Scotland, at the bridge.

In the Thomson conveyor the length of the trough is half the total length of the face; in the Bridgewater conveyor the trough is laid for nearly the whole length of the face, and a light carrier trough half the length of the face runs to and fro in the main trough. In both cases the movement of the working trough is accomplished by the aid of wire ropes coiled on drums at the central gate road, the drums being driven by either a compressed-air engine or an electric motor.

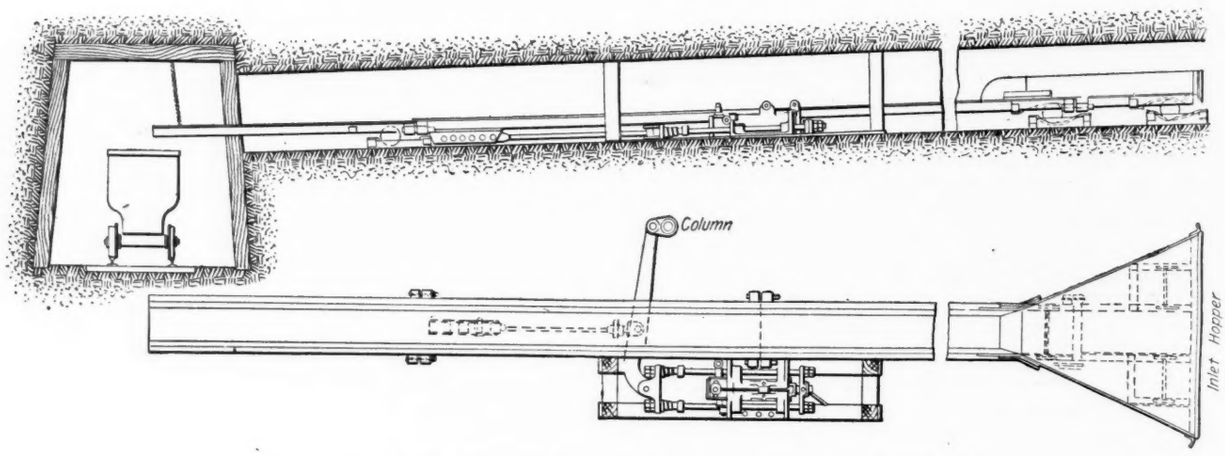


FIG. 20. PLAN AND SECTION SHOWING EICHOFF CONVEYOR AT FACE

In the Thomson apparatus there is one rope, the ends of which are secured to the ends of the moving trough, the middle of the rope being carried round friction drums or pulleys. The trough itself is moved from end to end of the face by a motion of the rope over the friction drum. The action is similar to that of an endless rope except that the trough is looped into the rope. In the Bridgewater conveyor the main-and-tail system is employed.

FIG. 21. VIEW OF AN EICHOFF CONVEYOR AT WORK

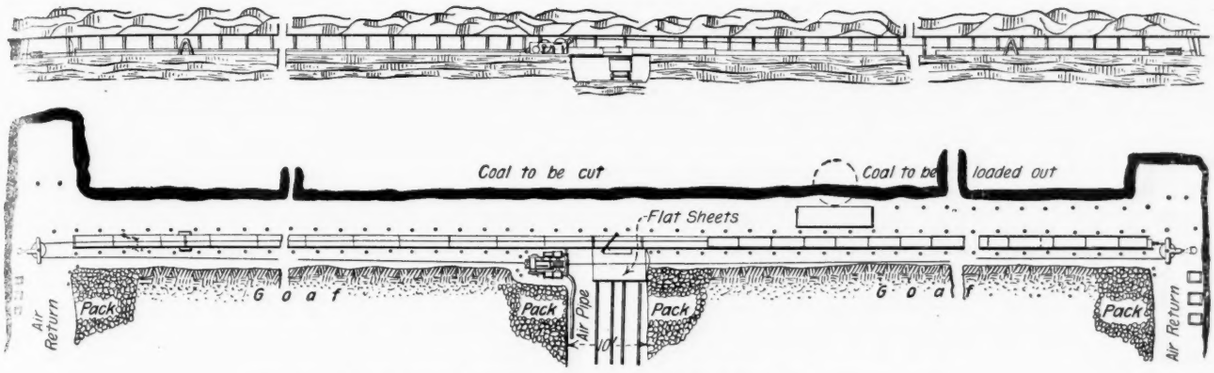


FIG. 22. PLAN AND SECTION SHOWING BRIDGEWATER CONVEYOR

There are two ropes, as in the main-and-tail system of haulage, each rope having its own drum which is connected to the driving engine or motor by a clutch, that can be thrown in and out at will. The end of one rope is attached

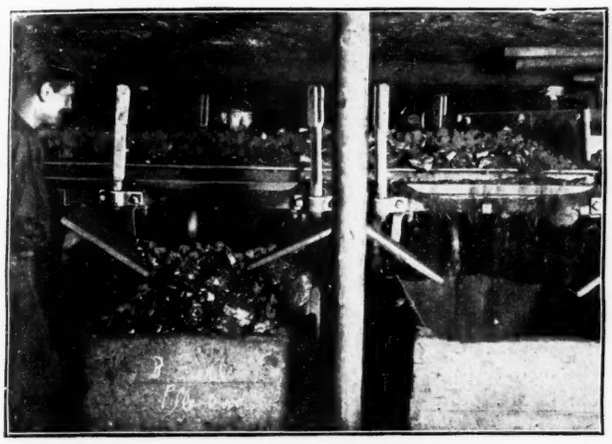


FIG. 23. THOMSON TROUGH CONVEYOR

to one end of the moving carrier and the end of the other rope to the opposite end of the carrier.

The carrier is hauled from one end of the face to the other by winding one rope upon its drum and letting the other rope pay out. The Diamond company says this method was adopted in preference to the endless-rope method as it avoids the necessity of any straining gear at the ends of the face.

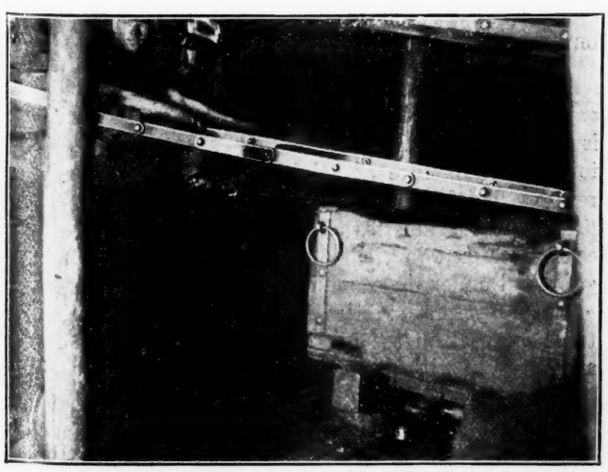


FIG. 24. ALLARDICE CHAIN CONVEYOR

With both systems the coal is loaded into the moving trough at that part of the face across which it is moving at the time, and it is discharged into the cars in the gate road by the aid of movable blades placed on the bridge. The moving trough runs under the blades, or scrapers, which are inclined at an angle such that the coal is forced off the trough and into the car below. There are usually two blades, one of which is unshipped and out of use, it being shipped into position when the trough commences to move in the opposite direction. The blades are pivoted at the end near the coal face and are pushed against a stop at the opposite end. This is shown clearly in Fig. 23.

In the Bridgewater conveyor a special arrangement is made to enable coal to be filled into the mine trough when the carrier is not there. When the carrier returns it picks up the coal from the mine trough and carries it back on its return journey to the center gate.

The moving trough conveyor is designed for use in low seams less than 2½ ft. in thickness. In the Bridgewater

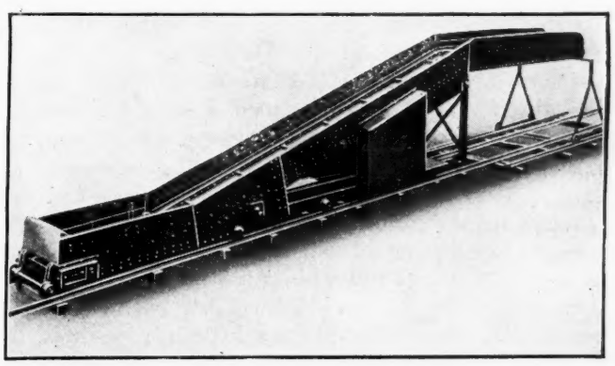


FIG. 25. GIBB GATE ROAD CONVEYOR

conveyor the height of the trough nearest the coal face is only 5 in. The apparatus is lower in cost than the Blackett and is therefore suitable for collieries working seams which are disadvantageously located. In the Bridgewater conveyor the troughs are made in sections 6 ft. long, 18 in. wide and 8 in. high on the goaf side, and 5 in. on the coal side. The goaf side is hinged at intervals. The carrier consists of steel trays 4 ft. long connected by a bayonet-jointed drawbar on the under side.

In the Thomson apparatus the troughs are open on the goaf side so that the blades, it is claimed, completely clean the coal out of the trough.

The moving chain conveyor without trough is another development of the trough chain conveyor. It is a short step from the trough with the chain running in it to a chain running alone. The only example of this scheme is

the Allardice conveyor, made by Anderson & Boyes. An endless chain is carried around sprockets attached at each end of the face. The working half of the chain runs on the floor in front of the face, the return half running on bolts secured to props overhead, the bolts being about 9 ft. apart. The chain is made of links formed from flat bar steel, the distance between centers of links being 9 in.

Scrapers are attached to the links about every 3 ft. The chain is driven by either a compressed-air engine or an electric motor by means of sprocket wheels whose teeth engage in the links of the conveyor chain itself. There is a treble reduction gearing between the engine or motor shaft and the sprocket wheel. The delivery of the coal to the mine cars, or hutches, is a little different from that of the other forms of conveyor that have been described.

The Allardice conveyor is not adapted to large coal, but rather to coal which breaks into small lumps and into slack. The lumps are carried by the chain and fall through it into the mine cars at the delivery end. The scrapers bring along all the coal that is not large enough to rest on the links and push it into the car. The usual arrangement for handling the coal in the gate road is made. This passage is driven a little in advance of the face. It is made wide enough for two tracks and a crossover is provided beyond the coal face.

The empty cars are pushed up under the conveyor in succession and are moved forward to the crossover as soon as they are filled. The full cars pass down the other road. The delivery end of an Allardice conveyor is shown in Fig. 24.

The Gibb Gate-End Conveyor

It was mentioned in the foregoing that the conveyor system is sometimes adopted in the gate road as well as along the face. Mavor & Coulson make a form of gate-end conveyor, invented, I believe, by a mine manager. The gate-end conveyor receives the coal from the face conveyor and delivers it to the cross-gate or the branch road where the cars are arranged ready to receive it. This arrangement enables gate roads to be made much smaller and at less cost than where the mine cars are taken to the face. It also enables the coal to be conveyed up an inclined gate road with much less labor and at less expense. Fig. 25 is a view of the Gibb gate-end conveyor, while Fig. 26 is a section and plan showing the arrangement.

The conveyor is run on rails which are laid up to the face with which it moves forward. The conveyor consists of an endless scraper chain running in a channel, as shown. The coal is delivered into the box at the bottom of the conveyor; the chain scraper takes hold of it there, carries it up the inclined road and along the level at the end, delivering it into the mine cars. A double line of tracks are laid in the cross-gate or branch road, into which the conveyor delivers. There is a crossover between the two roads, as shown, and a continuous stream of cars is kept moving up under the end of the conveyor and passing thence to the main haulageroad. The conveyor chain is driven by either an electric or compressed-air motor.

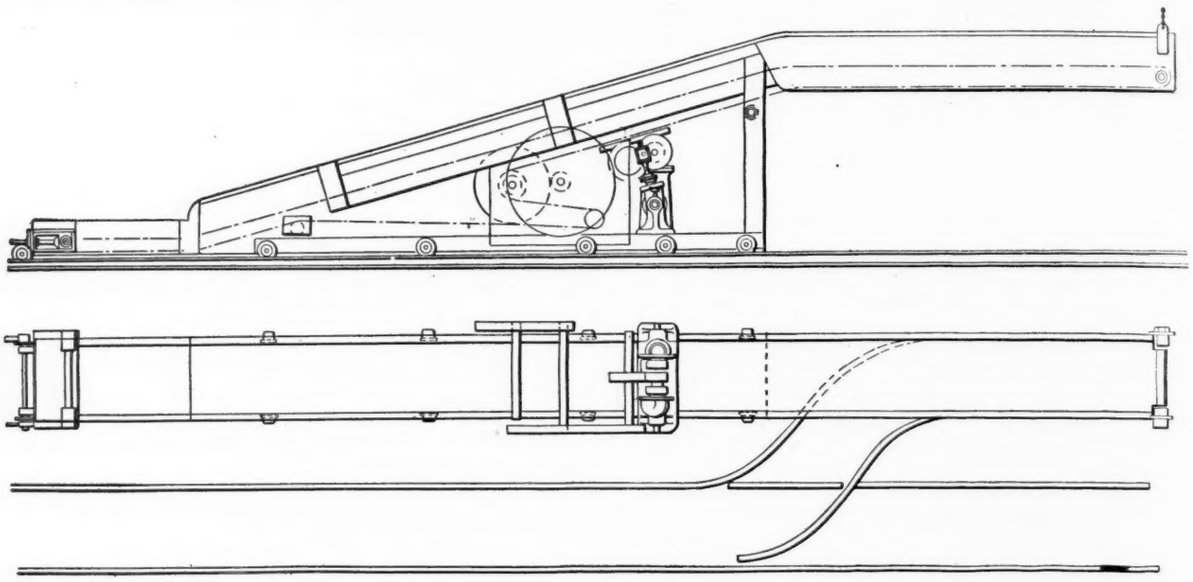


FIG. 26. PLAN AND SECTION OF GIBB CONVEYOR, SHOWING TRACK ARRANGEMENT

A Substitute for Coal

Whenever the price of a commodity advances to any extent, the public are fed with stories of wonderful substitutes that will revolutionize things and correct the unsatisfactory industrial situation. Here is the latest:

"Consul Dennison, at Christiania, Norway, reports that a Norwegian engineer has perfected an artificial coal substitute which has stood all tests. Manufacture on a large scale is to begin soon, and Norwegian coal imports are expected to be reduced 30 per cent. The artificial coal is made by treating sulphite lye—a byproduct incident to the manufacture of sulphite—heretofore regarded as refuse. The lye is reduced to a dust. The dust is compressed into briquettes and then burned. The artificial coal is claimed to yield 69,900 heat calories. Best English coal under the same tests yields only 7,000 calories."

With Federal investigations on one hand and substitutes for coal on the other, where is the fun in having a mine, even with present record prices?

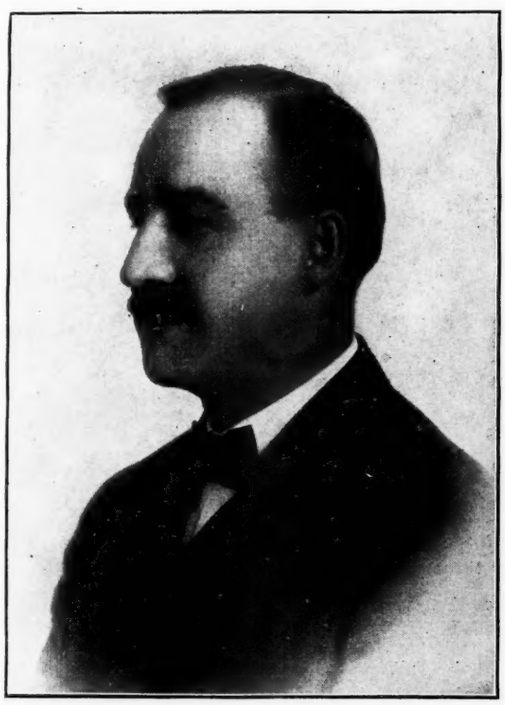
Both the Sulphur and the Volatile-Matter Content should be used to classify coals and to identify the coal guaranteed. Variations indicating the substitution of an unsatisfactory coal should be considered cause for rejection of the coal or for cancellation of the contract.

Who's Who In Coal Mining

Jay G. Puterbaugh

The greatest exponent of the idea of selling coal on a cooperative plan in the Southwest is Jay G. Puterbaugh, president of the McAlester Fuel Co. If there is any man in the industry who has devoted his entire life to the coal-mining business, it is this same gentleman. He is a western product all through, having been born in Newton, Kan., in 1876.

Mr. Puterbaugh's boyhood days were spent in Hutchinson, Kan. The hard times that visited that state after the boom of 1888 caused him to leave school and enter a retail coal office when only 15 years of age. After a



J. G. PUTERBAUGH
President, McAlester Fuel Co.

year's service he returned to school, continuing his studies for two years, after which he became associated in a new coal-sales company under the name of the Carey-Puterbaugh Coal Co.

In his nineteenth year he accepted a position as traveling salesman for the Western Coal and Mining Co., which concern was controlled by the Missouri-Pacific Railroad Co. In less than two years he was promoted to the position of division sales agent, with offices in Kansas City. A year later he was again promoted and placed in charge of all the company's sales in Texas and old Mexico, with offices at Dallas, Tex.

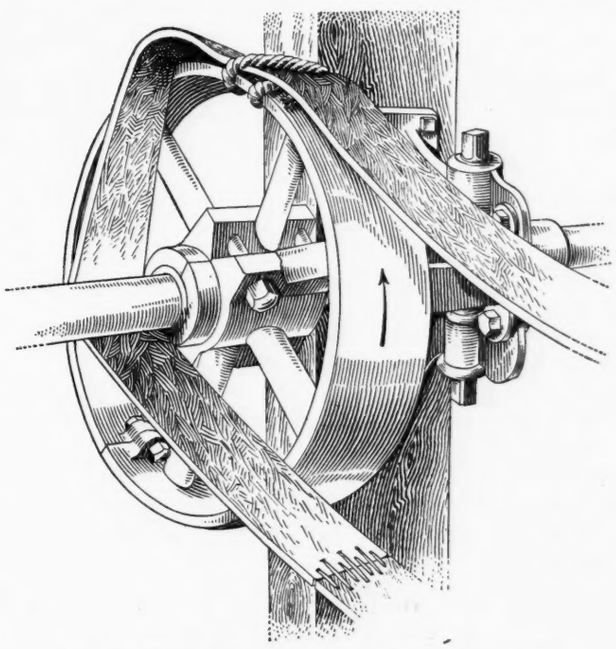
Mr. Puterbaugh continued his work in Dallas for four years, only leaving there to accept a place as assistant general sales agent of the same company at St. Louis, Mo. A short time later he resigned from the employ of the Western Coal and Mining Co. to become manager of the McAlester Fuel Co., of McAlester, Okla. This latter corporation was organized with the idea of filling the need for an operators' sales agency. From a small beginning the company has developed until it is now one of the largest distributors of coal in the Southwest. Its general offices are at McAlester, Okla., its first home, but important branch offices have been developed and are now being maintained at Kansas City, Omaha, Little Rock, Oklahoma City and Dallas. The present annual sales of the concern are 2,000,000 tons.

The success of the McAlester Fuel Co. substantiates Mr. Puterbaugh's theory that the greatest economy and efficiency in the disposition of the coal product of any particular district comes from having one large reliable distributing organization. Such a plan enables the mining companies to work with greater regularity and secures for them a more satisfactory and less variable price for their product.

Besides being president of the McAlester Fuel Co., Mr. Puterbaugh is vice-president of the American National Bank at McAlester and president of the United Charities of the same city. He is a member of the American Mining Congress, and it is safe to say that no man in his field is more highly esteemed and has the confidence of a greater number of his associates.

Putting Belts on Pulleys

To put a heavy belt on a pulley, first pull the belt over the pulling side of the driving pulley, wrap a rope around the pulley rim and over the belt where it rests on the pulley face; pull the ends of the rope from under the rim and pass them over the face of the pulley, between it and the belt, the ends pointing in opposite directions, says Arthur Avery in *Power*. The power may then be thrown on, and the belt will clamp the ends of the rope



A SAFE WAY TO HOLD A BELT TO A PULLEY

and both will be pulled along with the pulley. The rope will release itself and drop off as soon as the belt is on.

This may be an old idea, but it is a safe and sure method of putting on belts. There is one precaution that should be observed; do not use too long a rope as it may become entangled. As shown in the illustration, the ends should not project beyond the face of the pulley.

Machinery for Mitchell Type of Rectangular Coke Oven

By H. V. Schiefer*

SYNOPSIS—The rectangular coke ovens now being constructed in the coke region instead of the older beehive type, offer excellent opportunities for the advantageous employment of coke-handling machinery. By the use of levelers, quenchers, pushers and loaders manual labor on the coke yards is largely obviated, and the discharge of an oven is a question of minutes instead of hours.

The use of machinery for handling coke at the ovens is not only a question of economic efficiency, but in many instances is one of absolute necessity. In average times it is not unusual for a firm to spend as much as $5,000 for mechanical equipment that will replace the services of one man, but with the present labor shortage, especially in the mining districts, this would be considered only a nominal sum. Consequently, the question of handling machinery at the coke ovens is of paramount importance.

There are at the present time three general methods employed in producing coke—(1) The original beehive oven; (2) the Mitchell type of rectangular oven and (3) the byproduct oven.

Since there are practically no beehive ovens being constructed today, and when such ovens were built there was in most cases no thought of anything but hand labor, the machinery for them is naturally an adaptation to existing conditions. The Mitchell type of rectangular oven is a

*Cleveland, Ohio.

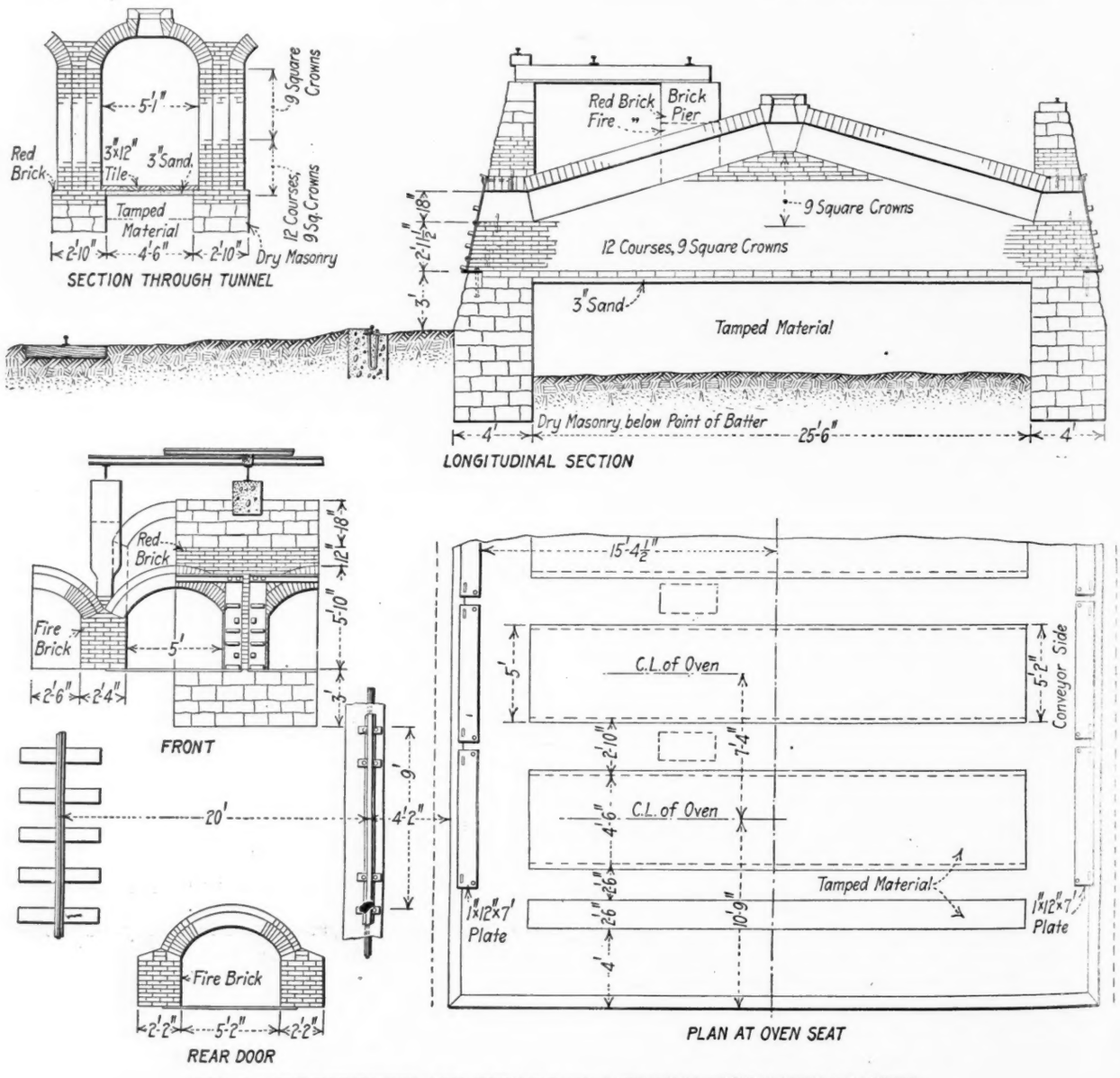


FIG. 1. ARRANGEMENT AND DETAILS OF A TYPICAL RECTANGULAR OVEN

compromise in shape between the old beehive and the byproduct oven. These ovens are consequently arranged so that mechanical handling machinery may be employed.

The byproduct oven is, of course, a step farther, with provision for the recovery of the byproducts from coking.

The machinery for the latter two classes of ovens is of a similar nature. The purpose of this article is, however, to deal with the machinery designed exclusively for the rectangular oven which is always situated at or near the mines where the shortage of labor is keenly felt.

Fortunately for the coke industry in general, the modern rectangular ovens of the various companies have so nearly the same general dimensions that a new design of machine for each installation is not necessary.

Fig. 1 shows the general arrangement and details of a typical rectangular oven. It will be seen that this is wider at one end than the other, a small amount of draft being allowed so that the stresses thrown on the pusher when emptying the oven are not too great.

The complete outfit of machines for handling the coke at such an oven consists of levelers, quenchers, pushers and loaders.

Two quenchers are usually employed, one operating on each side of the ovens. This is due to the mechanical difficulties of building a machine with a long arm.

Since the coal is dropped into the oven through one central hole, it must be leveled off. This is accomplished by a ladder-shaped steel arm called a leveler, which is pushed back and forth until the pile of coal is evenly distributed throughout the entire oven.

When the coking process is complete and the doors are opened, the quenching machines are used, doing the work better and in a fraction of the time that would be required by a man with a hose.

A modern rectangular oven can be "pushed" in a few minutes, whereas to "pull" the old beehive type of oven was a matter of from two to four hours. In the case of the old method there was also the disadvantage that the oven cooled off to such an extent that it required almost two hours before it was again burning properly. Thus with the new oven and machinery there is usually a saving in time of from five to six hours. Further economy is effected, since the rectangular ovens hold about nine tons of coal, which gives an output considerably greater than that of the beehive oven of the standard Connellsville type.

The quenching machines when their work is completed are replaced with the pusher and loader. The pusher rapidly forces the coke out of the oven onto the loader, thus reducing the time of clearing an oven from hours to minutes, pushing and loading being simultaneous.

FIG. 2. A COMBINED LEVELER AND PUSHER

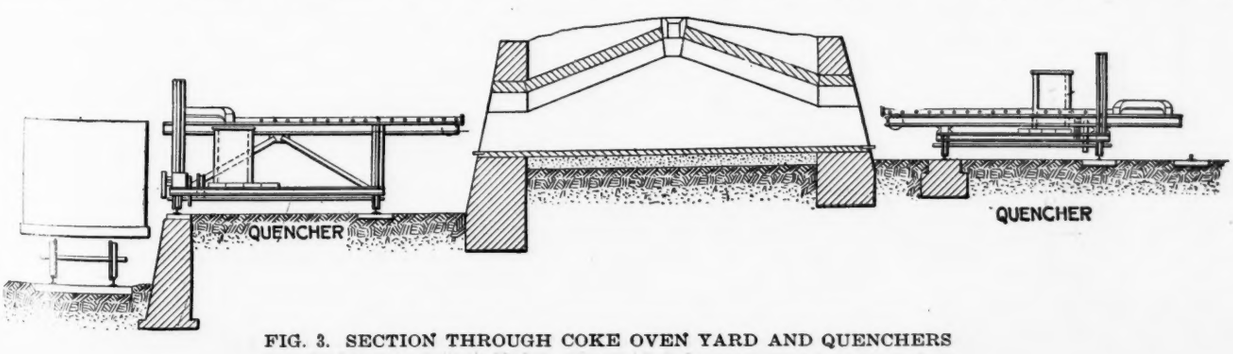


FIG. 3. SECTION THROUGH COKE OVEN YARD AND QUENCHERS

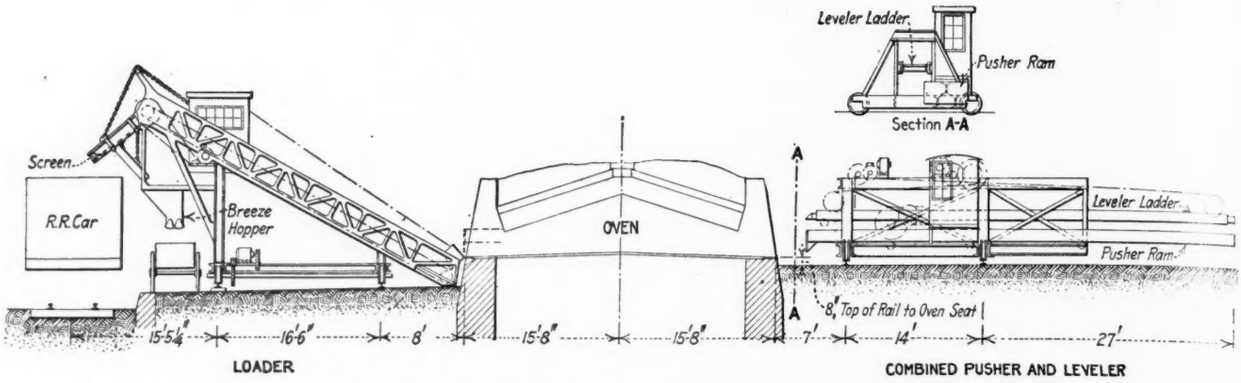


FIG. 4. A PUSHER AND LOADER IN POSITION AT OVENS

In order to reduce the machinery to a minimum it has been found practicable and economical to combine the leveler and pusher in a single machine. Such a machine as used by the Atlantic Crushed Coke Co., near Greensburg, Penn., is shown in Fig. 2.

Figs. 3 and 4 show sections through machines of this type. It will be noticed that considerable level ground space is required for the tail ends of the pushers and levelers. The ovens are generally located at the foot of a hill, so that this would require considerable excavation. This difficulty has been overcome by designing the machines shown in Figs. 5 and 6. The long arms of the pusher and leveler in these cases are provided with hinges which allow these arms to follow the contour of the land or, as is done in England, to conserve ground space. The arms may be hinged in even two or more places, thus permitting them to turn straight up at the rear of the machine. A notable example of this type of machinery is in use at the plant of the Saltley Gas Works at Birmingham, England, where the pusher ram is fitted with rollers which run along the oven floor while the coke is being discharged, thus relieving the stress on the axle of the driving wheel.

Fig. 7 shows a Seaver-Moore patented quencher destined for the Snowden Coke Co. at Derry, Penn. This machine consists of a traveling arm composed of pipe, the spraying end of which consists of a 4-in. extra-heavy pipe fitted with 32 branches of 1¼-in. pipe, all perforated on the under side. This is fitted onto a 7-in. extra-heavy pipe that is mounted on a carriage and runs between a pair of steel channels which act as guides. The sprinkler arm has a stroke of 37 ft. and is driven at a speed of 60 ft. per min. by a 5-hp. motor running at 725 r.p.m. This motor and the necessary gear reductions are mounted directly on the above-mentioned carriage. The water is fed to the traveling arm through a flexible pipe connection and a 35-ft. length of 3-in. rubber hose at a pressure not to exceed 50 lb. per sq.in.

The traveling arm and guide therefor are mounted on a substantial structural-steel base which is in turn supported on four 21-in. cast-steel wheels, two of which are geared to a 7½-hp. motor running at 700 r.p.m. The traversing speed is 300 ft. per min.

Fig. 4 shows a combination coke pusher and coal leveler as manufactured by the C. O. Bartlett & Snow Co., operated entirely by electric motors. The machine consists of a structural-steel frame carried on four steel track wheels. Upon the frame is mounted a pusher ram, together with its operating mechanism, arranged to push the coke from the ovens, also the coal leveler with its operating mechanism arranged to hoist and lower the leveler ladder and to operate it within the ovens to level the coal.

The ram consists of a heavy rolled-steel section having a head made of a 1-in. steel plate 4½ ft. long and 27 in.

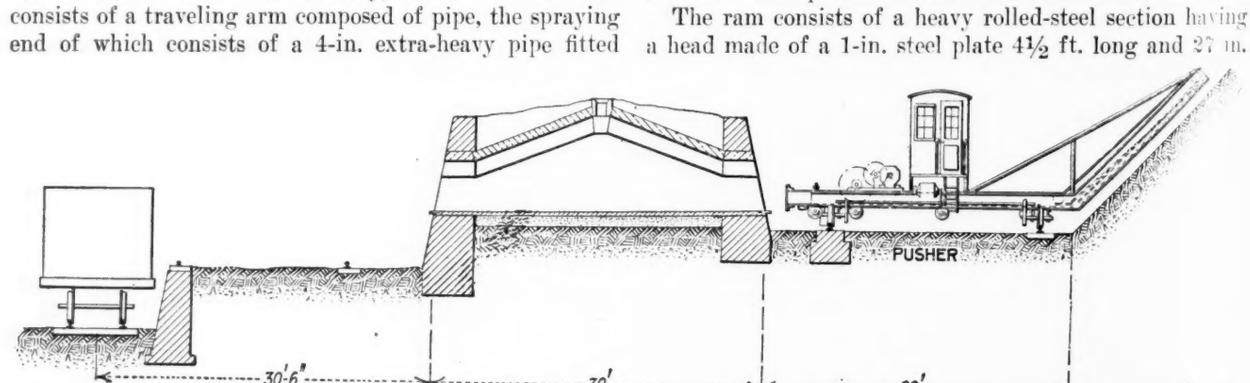


FIG.5

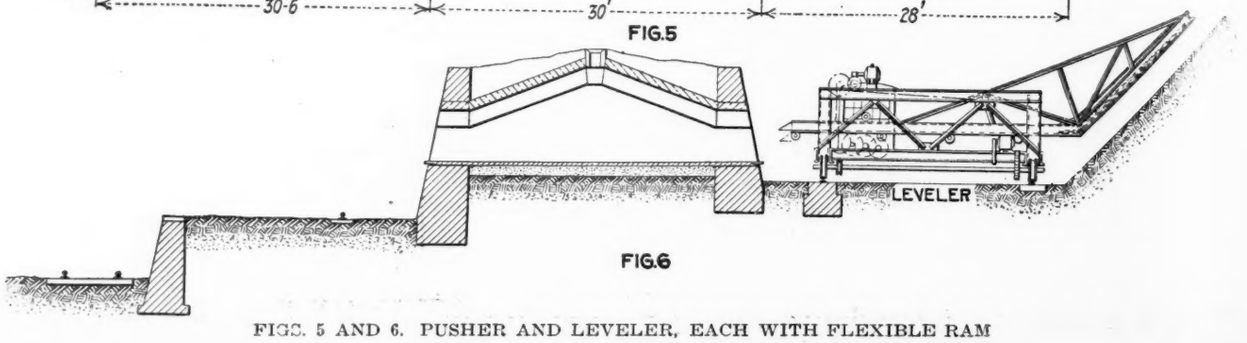


FIG.6

FIGS. 5 AND 6. PUSHER AND LEVELER, EACH WITH FLEXIBLE RAM

deep, securely attached to the ram with gusset plates and steel angles. On top of the ram is securely bolted a steel rack with which meshes a heavy steel pinion having teeth with 2½-in. pitch and 7-in. face. The ram is carried on cast-steel rollers keyed to pins which run in bronze-bushed bearings. The driving pinion is actuated by a 40-hp. mill-type motor through a set of cut-steel spur gears.

The leveler consists of an adjustable frame hung on chains winding on drums which are operated by a 5-hp. motor through spur and worm gearing so arranged as to be automatically locked in any position.

In the ladder frame is carried a ladder with a heavy cast-steel head. This ladder consists of bars securely braced and tied together. It is driven back and forth by means of ropes attached to either end and winding on a

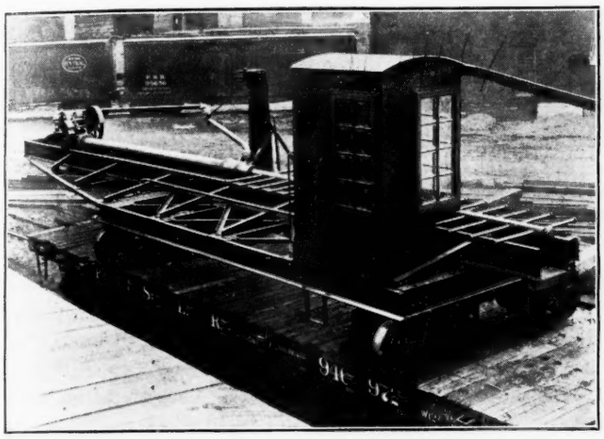


FIG. 7. COKE QUENCHER WITH FLEXIBLE PIPE CONNECTION

drum carried on the framework of the machine. This drum is driven through a train of steel spur gearing mounted on cold-rolled steel shafts carried in heavy babbitted pillow blocks by a 25-hp. series-wound slow-speed motor.

The operating ropes are ¾ in. in diameter—6x19 plow steel. The framework of the machine is composed of structural-steel shapes, thoroughly braced and tied together so as to form a rigid construction capable of withstanding the shocks incident to a machine of this character. The front sills are provided with cast-iron shoes to engage the heads of the rails, so as to take up the thrust of the pusher ram while pushing the coke from the ovens.

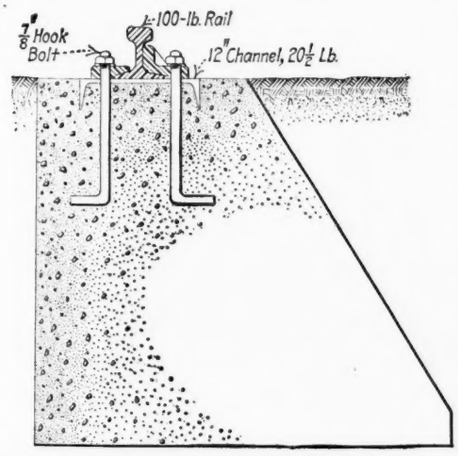


FIG. 8. MACHINE RAIL ANCHORED IN CONCRETE

FIG. 9. COKE LOADER IN PLACE AT THE OVENS

This rail is a heavy section weighing 100 lb. per yd. and is thoroughly anchored, as shown in Fig. 8.

The framework of the pusher is carried on four 21-in. double-flanged steel wheels keyed to the axles. These axles run in heavy babbitted bearings provided with special oil reservoirs. Two of the wheels, one on either track, are connected by means of cast-steel spur gearing to a 20-hp. series-wound slow-speed motor.

The gearing is all covered with sheet-iron guards to protect it from the weather. The guards are provided with handholes and doors for accessibility.

The operator's cab is made of structural steel covered with No. 12 steel plate and houses the controllers, etc. It is placed in such a position that the operator has a full view of his work. A mud box is provided along the side of the machine 30 in. wide 30 in. high and 12 ft. long, made in three sections, each section fitted with a door. The ram speed of the pusher is from 30 to 60 ft. per min. The ladder speed of the leveler is 80 ft. per min., and the traversing speed of the machine is 300 to 350 ft. per min. The total weight is about 40,000 lb.

The coke loader consists of a steel frame, as shown in Fig. 9, carrying the conveyor which is composed of a steel apron running under a stationary trough and arranged with steel angle flights to carry the coke from the oven and discharge it onto a chute provided with a screen.

The outer end of the chute is arranged to fold up to give proper railroad clearance. Underneath the screen is a hopper for receiving the screenings. This hopper is provided with a gate so arranged that the screenings can be discharged directly into a car on the yard level. The framework is supported on four 21-in. steel track wheels geared to an electric motor. This frame is built up of structural steel shapes, the main members consisting of 8-in. channels, securely braced and tied together so as to form a rigid construction. The lower portion of the frame is designed so that the machine may pull an empty freight car up a 2 per cent. grade.

The machine is traversed by means of a 19-hp. motor through a train of steel gears, two of the four wheels being geared to the motor. A band brake is provided for stopping the machine. This brake is actuated by a foot lever located in the operator's cab.

The conveyor is a standard picking-table type, consisting of ¼-in. overlapping steel flights with pressed-steel ends carried on two heavy drop-forged steel chains equipped with rollers 3 in. in diameter. The flights are provided with angles to carry the coke up the incline and prevent it slipping on the apron. The stationary trough plates of the conveyor overlap the pressed-steel ends of the

flights and consist of ¼-in. steel plates stiffened with angles. Both the loaded and return strands of the conveyor chain are carried on 20-lb. tee rails.

The 2 15/16-in. diameter foot shaft carries 24-in. diameter sprockets and runs in adjustable bearings for taking up the chain wear. The lower end of the conveyor is provided with an adjustable chute, which is raised and lowered by means of a winch in the operator's cab and is so arranged that the coke will discharge into the conveyor without spilling. When folded up this chute will clear the doors of the ovens.

The head, or driving, shaft is 3 7/16 in. in diameter and is provided with 24-in. sprockets. It is geared to a 19-hp. motor by two sets of steel spur gears, the first having cast teeth and the other having cut teeth.

The screen consists of ⅜x 3/16 x1¾-in. screen bars 4 ft. long, with ¾-in. openings between them. Below the screen is the breeze box made of 3/16-in. steel plates and fitted with a swinging gate operated by a lever from the ground. The gate is 12x36 in. Beyond the screen is an adjustable chute which is raised and lowered by a winch in the operator's cab. The screen and chute are 7 ft. wide.

A mud box is provided on this machine the same size as the one on the pusher. The conveyor runs at speeds of 30 to 150 ft. per min., the traversing speed is from 300 to 350 ft. per min., and the weight is 30,000 lb.

An Old Ohio Mine Without Railroad Connections

By Wilbur G. Burroughs*

SYNOPSIS—Description of an operation that enjoys the double distinction of being the oldest shaft mine in the state and without any railroad facilities. The plant is quite modern.

Near the heart of the business section of Steubenville, Jefferson County, Ohio, is one of the oldest shaft coal mines in the state, having been opened in 1857. It is known as the High Shaft mine, and is owned by the Steubenville Coal and Mining Co. Although it has the distinction of having been operated for so many years the mine is up to date in all particulars.

The coal is reached by a hoisting shaft 7x14 ft. inside dimensions, and 225 ft. deep. The shaft for the first 72 ft. passes through soft, runny clay which is constantly kept in a wet condition by groundwater. Next the shaft penetrates firm shale and sandstone which form walls that stand well and require scarcely any timbering.

In modernizing the mine the timbers that originally reinforced that portion of the shaft passing through the clay were replaced by a concrete lining 2 ft. thick. In this substitution the shaft timbers could not be removed from the bottom upward for the shaft would cave in so unstable was the surrounding clay. To overcome this danger sections of concrete 5 to 6 ft. high were placed at a time. About 30 in., vertically, of the old shaft timbers were removed at the top, the concrete shell sunk down the shaft this distance, then another 30 in. of timbering taken out, the shell sunk another 30 in., and so on. Thus little by little the entire 72 ft. of timbering was removed and the concrete lining put in its place.

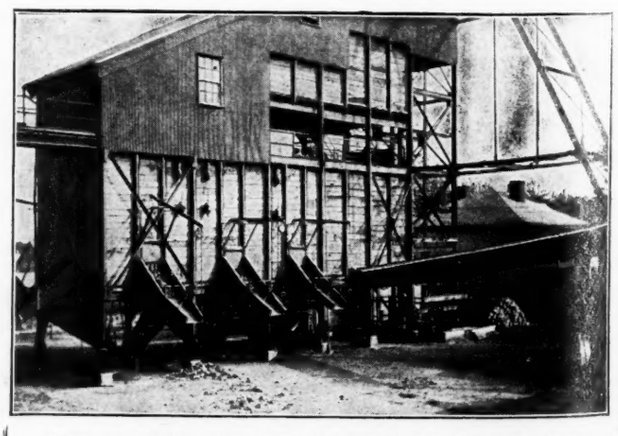
The coal seam mined is the Lower Freeport, Allegheny series, Pennsylvanian system. A section runs as follows: Sandstone, 40 to 50 ft.; shale, 15 to 20 ft.; upper bench of coal, 42 in.; slate parting, 2 in., and lower bench of coal, 7 to 14 in.

At the High Shaft mine the coal is mined by the room-and-pillar method. Double entries, 9 ft. wide and 6 ft. high, with a 30-ft. pillar of coal between, are driven approximately on the face and butt cleats. From the bottom of the hoisting shaft the main haulageway runs north and south. Butt entries are turned east and west every 500 ft., and from the butts face entries are turned every 250 ft. The rooms, turned at 42-ft. centers, usually full width from the butt entries, are 22 ft. wide, 6 ft. high and 250 ft. long. Thus a 20-ft. pillar of coal separates the rooms. Breakthroughs are cut between entries and staggered between rooms every 60 ft.

For ventilation there is an air shaft 8x16x180 ft. deep, with a stairway three-quarters of a mile north of the hoisting shaft. There is a 12-ft. steam exhaust fan. At the bottom of the hoisting shaft is a 24-in. electric fan and near the working face a Robinson 42-in. electric force fan. To keep the mine dry a Deming 5-hp. electric pump is operated about five hours per day.

The coal is mined with four Morgan-Gardner electric mining machines. The haulage is accomplished with one General Electric and one Morgan-Gardner electric mine locomotive. The heaviest grade is 3 per cent.

At the shaft the coal is hoisted onto a self-dumping cage made by the Connellsville Manufacturing and Mine Supply Co. It is said to be one of the smallest self-dumping cages ever installed in this region. It is 4 ft. 1½ in. face to face of cage guides and operates on the 8-in. face of the guide timber. The platform of the cage is 5 ft. 7 in. long. Safety dogs, safety chains and the general detail of the floor, arms for holding the car on the cage, tipping arrangement, etc., are the same as for the larger cages. The hoisting is accomplished by means of a pair



VIEW OF TIPPLE, SHOWING STORAGE BINS AND LOADING CHUTES

*11 Wiley Ave., Chautauqua, N. Y.

of Crawford & McCrimmon 18x32-in. direct-acting steam hoisting engines.

The coal, which is sold mostly for local use, is delivered from the tipple into wagons and motor trucks which are weighed on a scale in front of the office building to the right of the tipple, as shown in the accompanying illustration. There are no railroad connections, so the tipple, which was designed by George S. Baton & Co., of Pittsburgh, Penn., was so arranged that the screens and bins could most easily and economically deliver three grades of coal to the wagons for their retail trade.

The coal is dumped at the tipping floor into a concentrating chute from which it passes over screens that separate it into lump, nut and slack, each grade being delivered by chutes into their respective bins. Vertical chutes convey the nut and slack from the bins to the lower nut and lower slack bins, from where the coal is delivered into wagons and motor trucks on the ground below, as illustrated. The slack is discharged from the bins by a flat slide in the bottom of the bin. The nut and lump coal is discharged through the sides of the bin over small rescreens, thus cleaning the coal before it goes into the wagons. The slack coal obtained from the small rescreen is led by a chute to a drag conveyor on the surface of the ground beneath the tipple, which delivers it to a bucket elevator and thence into the slack bin. From this slack bin a chain conveyor carries it to the power house.

A steel trestle has been built from the end of the tipple, the track running at the elevation of the top of the lower bins. The car used on this trestle receives slack and nut coal from a slide in the bottom of the upper bins and the lump coal over a bypass in the screening equipment. In this way 85,000 bu. of coal are stored on the ground for summer use, the mine being idle from Apr. 1 to Sept. 1. The ground on the sides of the tipple, where the wagons load, is paved with brick on one side and concrete on the other. Thus coal, refuse, etc., is readily cleaned up.

The power plant, which is housed in a brick building near the tipple, contains a Harrisburg-Fleming 300-hp. engine with direct connection to a 200-kw. General Electric Co. generator; a Skinner automatic engine driving a 100-kw. Morgan-Gardner generator, and two 150-hp. Erie Iron Works boilers with Murphy automatic stokers. The hoisting engines have already been referred to.

For information the writer is indebted to E. Jones, superintendent, and D. J. Jones, engineer.

Lubrication Points

It was pointed out to the members of the Institution of Electrical Engineers of Yorkshire, England, that a vital question in the running of plants is lubrication. G. Dearle says as far as possible the lightest oil should be selected, since it must be accepted as a fact that the lighter the oil the less the carbon deposit will be. Also a thin oil absorbs a minimum amount of power. This carbon deposit is one of the greatest troubles of the user of the internal-combustion engine. It is not always owing to bad oil; it may result from the driver being too liberal with the amount fed to each cylinder.

Bad mixture will, of course, also account for carbon deposit, and the oil is blamed when, if an examination of the waste gases were made, the fault would be found to lie with the driver or chargeman. A well known maker of gas engines recommends one drop per minute per inch of cylinder diameter.

The Real Cause

By Rufus T. Strohm

Written Expressly for Coal Age.

The Ambulance Came Speeding

WHEN the ambulance came speeding
With its prone, unconscious freight,
And they took him, limp and bleeding,
Fearful of the slightest wait,
Those who worked with practiced motions,
Cleaning all his wounds of dirt,
Binding up with lint and lotions,
Wondered what had caused his hurt.

BY the bluish scars outstanding
Underneath his grime and tan,
There was no delay in branding
This one as a mining man;
So, the while they cleansed his gashes,
Bandaged battered head and chest,
Stitched the ragged, gaping slashes,
Varied were the views expressed.

ONE insisted that the stranger
Having all too deeply quaffed,
Stupefied and blind to danger,
Might have tumbled down a shaft.
Others thought the man's condition
Was an all-sufficient proof
Of the natural suspicion
He was crushed by fall of roof.

WHILE they dealt in inferences,
Bandied theories in vain,
He regained his normal senses,
So they asked him to explain.
Turning slowly on the bedding,
In his broken tongue he said,
"Me—I go my buddy's wedding—
Fight—and bottle bust my head!"

When He Regained His Normal Senses.

American Mining Congress Program

The following is the provisional program of the annual convention of the American Mining Congress to be held at hotel La Salle, Chicago, Nov. 13 to 16, 1916.

The morning sessions will be general meetings, which all members will be expected to attend. The afternoon sessions will be divided into sections, each devoted to discussions of a particular branch of the industry.

General Sessions

Monday, Nov. 13—2 P.M.

Convention called to order at 2 p.m. by Harry C. Adams, chairman Committee of Arrangements.

Address of welcome—Hon. Edward F. Dunne, Governor of Illinois.

Address of welcome—Hon. Wm. H. Thompson, Mayor of Chicago.

Address of welcome—J. W. O'Leary, President Chicago Association of Commerce.

Response to addresses of welcome.

Three-minute responses by representatives of the several states, each with resolution embracing state's most important mining issue.

Tuesday, Nov. 14—10 A.M.

Presiding, Carl Scholz.

Alternate chairman, Charles S. Keith, Kansas City, Mo.

Subject—"Safety in Mining Operations."

Introduction of resolutions.

Address—"The Record of Mine Safety Work," Albert H. Fay, United States Bureau of Mines.

Address—"State Mine-Rescue Methods," Dr. H. H. Stoek, Urbana, Ill.

Address—"Safety Work as an Investment," C. W. Goodale, Butte, Mont.

Address—"Responsibilities and Duties in Mine Safety Work":

"Of the Operator," Thomas M. Gann, Knoxville, Tenn.

"Of the Miner," David Ross, Springfield, Ill.

"Of the Public," Judge W. D. Hoag, Joplin, Mo.

Open discussion under 10-minute rule.

Selection of Committee on Resolutions.

Recess.

Tuesday Evening, Nov. 14—8 P.M.

Annual members' meeting for the election of directors and the transaction of routine business.

Wednesday, Nov. 15—10 A.M.

Hennen Jennings, Washington, D. C., presiding.

Alternate Chairman, Dr. James E. Talmage, Salt Lake City.

10 a.m. subject—"Efficiency in Mining Operations."

Introduction of resolutions.

Report—Committee on Relations with Federal Trade Commission, Charles M. Moderwell, Chairman, Chicago, Ill.

Address—"Federal Aid to Mining Efficiency," Van H. Manning, Washington, D. C.

Address—"The Federal Trade Commission and Its Relation to the Mining Industry," Hon. E. N. Hurley, Washington, D. C.

Address—"Industrial Coöperation Under the Sherman Law," Glen W. Traer, Chicago, Ill.

Address—"The Sherman Law and Its Relation to Mining," to be selected.

Address—"Efficiency in Ore Treatment," E. P. Mathewson, Anaconda, Mont.

Discussion.

CARL SCHOLZ
President, American Mining Congress

J. F. CALLBREATH
Secretary, American Mining Congress

CONGRESSMAN M. D. FOSTER
Chairman, Committee on Mines

THURSDAY, NOV. 16—10 A.M.

Walter Douglas, New York City, presiding.

Alternate Chairman, Samuel A. Taylor, Pittsburgh, Pa.

Subject—"Conservation."

10 a.m.—Introduction of resolutions.

Report—Committee on Forest Relations, Carney Hartley, Denver, Colo., chairman.

Address—"Conservation: Its Purpose, Its Effect, and Who Should Pay for It," to be selected.

Address—"The Accomplishment of Invention and Its Relation to Labor and Capital," Hennen Jennings, Washington, D. C.

Address—"Conservation in Mining Through Water-Power Development," Charles F. Potter, Los Angeles, Calif.

Address—"Waste in the Mining Industry—in Mining—in Distribution and in Use—and the Relation of These Wastes to—the Operator, the Consumer, and the Public," to be selected.

MONDAY EVENING, NOV. 13—8 P.M.

Presiding, Sidney Norman, Spokane, Wash.

Illustrated lecture—"Mining in the Arctic Regions of Alaska and Siberia," Dr. Henry Mace Payne, New York City.

Illustrated lecture (moving)—"The Cerro Azul Gusher," E. L. Doheny, Los Angeles, Calif.

METALLIFEROUS SECTION
TUESDAY, NOV. 14—2 P.M.

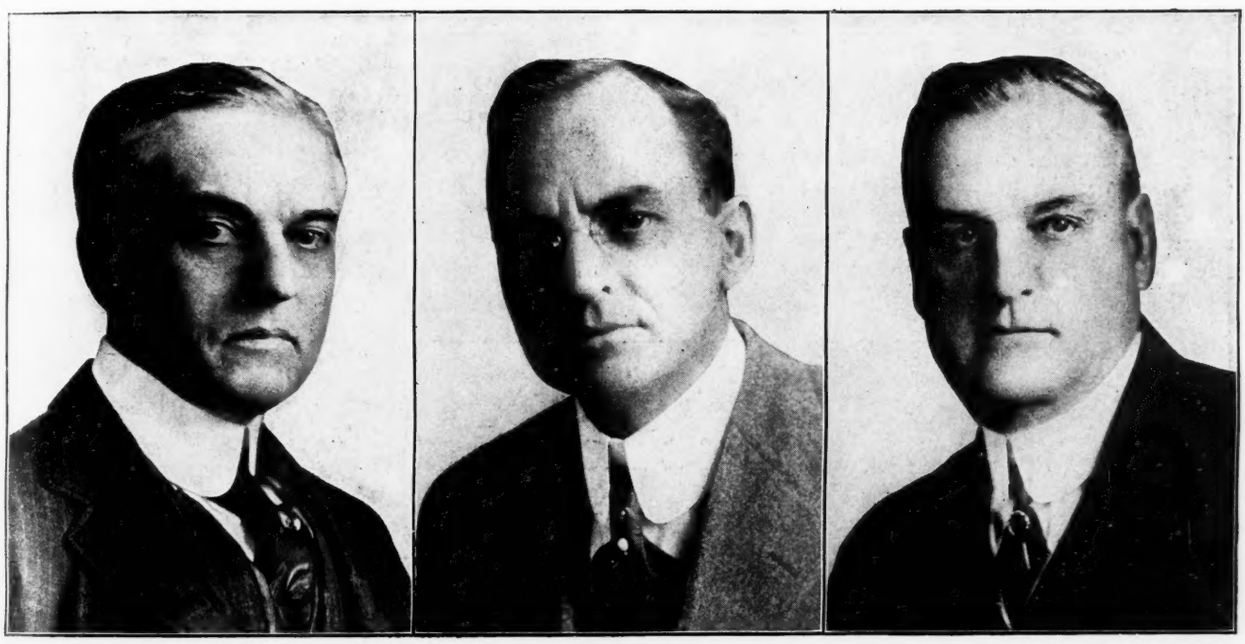
Irving T. Snyder, Denver, presiding.

Alternate Chairman, George E. Collins, Denver.

Address—"The World's Gold Supply and Its Sufficiency for Business Needs," Dr. Waldemar Lindgren, Boston, Mass.

Address—"The Mining Industry," C. A. Tupper, Chicago, Ill.

Address—"The Lead and Zinc Resources of the United States," C. E. Siebenthal, United States Geological Survey, Washington, D. C.



C. M. MODERWELL
Director, American Mining Congress

W. R. WHITNEY
Research expert, General Electric Co.

VAN H. MANNING
Director, United States Bureau of Mines

Address—"The State Geologist and Conservation," Dr. A. H. Purdue, Nashville, Tenn.

Address—"X-Ray Development," Dr. W. R. Whitney, Schenectady, N. Y.

Address—"The New Things in Science," Dr. F. G. Cottrell, San Francisco, Calif.

THURSDAY EVENING, NOV. 16—8 P.M.

Banquet.

Address—"Coöperation, the Basis of Safety, Efficiency and Conservation in the Use of the Nation's Mineral Resources," Carl Scholz, Chicago.

Address—"Organized Capital and Organized Labor and Their Relation to Efficiency, Conservation, Better Wages, Better Living Conditions, Lawlessness, Strike Disorders and Industrial Freedom," Col. George Pope, Hartford, Conn.

Address—"A Tariff for Revenue as Related to a Compensating Duty on Lead and Zinc Ores," Otto Ruhl, Joplin, Mo.

Address—"The Copper Resources of the United States," Walter Harvey Weed, New York City.

WEDNESDAY, NOV. 15—2 P.M.

Hon. Albert Johnson, Hoquiam, Wash., presiding.

Alternate Chairman, W. W. Risdon, Albuquerque, N. M.

Topic—"Mine Manufacturing the Best Industry of the Rocky Mountain West," John Hays Hammond, New York City.

Address—"How To Protect the Small Investor in Metalliferous Mines," Hon. W. R. Allen, Butte, Mont.

Address—"Smelter Contracts and Market Quotations," R. M. Henderson, Breckenridge, Colo.

Address—"Copper and Its Relation to Preparedness and Industrial Efficiency," to be selected.

Address—"The Marketing of Zinc Ores," W. B. Shackelford, Webb City, Mo.

Address—"Oil Flotation," Dorsey A. Lyon, Salt Lake City.

Address—"Coöperation in the Lead and Zinc Industry."

Open discussion under five-minute rule.

THURSDAY, NOV. 16—2 P.M.

Samuel D. Nicholson, Leadville, Colo., presiding.

Report—Committee on Revision of Mineral Land Laws, E. B. Kirby, New York, chairman.

Address—"The Foster Bill," Dr. M. D. Foster, chairman, House Committee on Mines and Mining.

Address—"The Revision of Mining Laws," Hon. Charles S. Thomas, United States Senator from Colorado; Frank L. Peckham, Washington, D. C.

General discussion.

Address—"The Rare Metals," Dr. R. B. Moore, Denver, Colo.

Address—"Oil Land Withdrawals," Judge George H. Patrick, Washington, D. C.

Address—"The Relation of the Federal Government to Western Oil Production," Hon. James N. Gillett, San Francisco, Calif.

Address—"The Federal Government and the California Oil Claimants," Hon. James D. Phelan, United States Senator from California.

Discussion—Led by Thomas A. O'Donnell, Los Angeles, Calif.

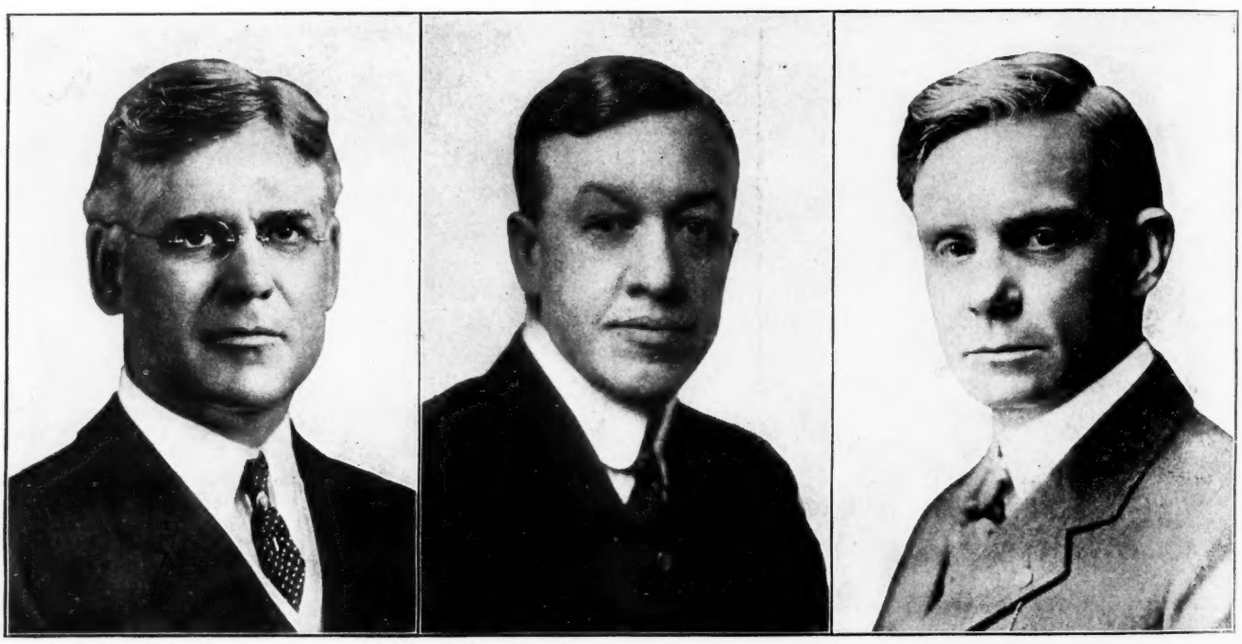
WEDNESDAY, NOV. 15—2 P.M.

Dr. Norman Bridge, Los Angeles, Calif., presiding.

Address—"Geology in Its Relation to the Oil Industry," J. C. McDowell, Pittsburgh, Penn.

Address—"The Future of the Dye Industry Through the Use of Petroleum," Dr. Walter F. Rittman, Empire Building, Pittsburgh, Penn.

Address—"Practical Phases of the Standard Oil Dissolution, and the Necessity of Combinations Among Independent Producers To Meet Unfair Competition," R. L. Welch, Chicago, Ill.



H. E. WILLARD
Coal operator, Cleveland, Ohio

RALPH CREWS
Address convention on "Marketing Coal"

CHARLES S. KEITH
Coal operator, Kansas City

Address—"The Prospector and the Apex Law," Theodore F. Van Wagenen, Denver, Colo.

Address—"Workmen's Compensation in the Metalliferous Mining Industry," Hon. Thomas Kearns, Salt Lake City, Utah.

Address—"Electrolytic Separation," Fred Laist, Anaconda, Mont.

OIL AND GAS SECTION

TUESDAY, NOV. 14—2 P.M.

Ralph Arnold, New York City, presiding.

Address—"The Oil Resources of the United States," W. A. Williams, United States Bureau of Mines.

Address—"The Authority of States To Tax Production from Indian Lands," Hon. J. G. Gamble, Assistant Attorney C., R. I. & P., Des Moines, Iowa.

Address—"Federal Coöperation with the Oil Industry," H. G. James, Kansas City, Mo.

THURSDAY, NOV. 16—2 P.M.

S. Y. Ramage, Oil City, Penn., presiding.

Address—"The World's Oil Supply," Ralph Arnold, New York City.

Address—"Naval Oil Reserves as a Necessity to National Preparedness," to be selected.

Address—"The Future of the Natural Gas Industry," Judge Thomas J. Flannelly, Independence, Kan.

Address—"The Relation of the Federal Government to Scientific Research in the Oil and Gas Industry," to be supplied.

Address—"Modern Oil Storage," G. B. James, Chicago, Ill.

Discussion—Led by Alf. G. Heggem, Tulsa, Okla.

Address—"The Chemical Possibilities of Petroleum," Dr. David T. Day, Washington, D. C.

Coal Section

Tuesday, Nov. 14—2 P.M.

C. M. Moderwell, Chicago, Ill., presiding.

Report—Committee on Uniform Cost Accounting System, S. A. Taylor, Pittsburgh, chairman.

Address—"Coöperation in the Marketing of Coal," Ralph Crews, Chicago, Ill.

Discussion under ten-minute rule—C. P. White, Cleveland, Ohio; C. G. Hall, Terre Haute, Ind.; R. A. Hord, Lexington, Ky.; W. P. De Armit, Pittsburgh, Penn.; G. H. Parker, Columbus, Ohio; W. H. Huff, Denver, Colo.; H. N. Taylor, Kansas City, Mo.; W. J. Spencer, Brereton, Ill.; James E. McCoy, Knoxville, Tenn.; T. L. Lewis, Charleston, W. Va.; W. W. Bridges, Drakesboro, Ky.; W. H. Cunningham, Ashland, Ky.; Carl J. Fletcher, Indianapolis, Ind.

Open discussion under five-minute rule.

Report—Committee on Workmen's Compensation, T. L. Lewis, Charleston, W. Va., chairman.

Address—"The Cost of Coal," George Otis Smith and C. E. Lesher, United States Geological Survey.

"New Ideas in the Preparation of Eastern Coal," Warren Roberts, Chicago, Ill.

"The Disadvantage of Widely Fluctuating Coal Prices," Hugh Shirkie, Terre Haute, Ind.; D. J. Jordon, Oklahoma City, Okla.; John Laing, Charleston, W. Va.

Wednesday, Nov. 15—2 P.M.

Dr. I. C. White, Morgantown, W. Va., presiding.

Address—"The Colorado Industrial Commission," Wayne Williams, Denver, Colo.

"Coöperation in the Coal Industry," H. E. Willard, Cleveland, Ohio.

"The Duties of Mine Inspectors," J. W. Paul, Pittsburgh, Penn.

"The Closed Shop and the Check-off as Related to Efficiency in Mining Operations," Dorset Carter, Oklahoma City, Okla.

"What Becomes of the Benefits of Production Efficiency?" George H. Cushing, Chicago, Ill.

"The Influence of Inter-district Competition on Economy in Southwestern Coal Production," J. G. Puterbaugh, McAlester, Okla.; Harry N. Taylor, Kansas City, Mo.

Address—E. W. Parker, Wilkes-Barre, Penn.—Subject to be selected.

Thursday, Nov. 16—2 P.M.

J. C. Kolsem, Terre Haute, Ind., presiding.

Address—"Coal and Its Byproducts," Alfred M. Ogle, Terre Haute, Ind.

"Two Years' Experience in the World's Coal Markets and Its Lesson," F. S. Landstreet, New York City.

Discussion.

"After the Association, What?" W. S. Bogle, Chicago, Ill.

"Unequal Distribution of Bituminous Coal and Its Cost to Operator, Retailer and Consumer," K. U. Meguire, Louisville, Ky.

"World Trade Conditions of the Future," Charles L. Dering, Chicago, Ill.

"Difficulties I Have Met in Coal Litigation and the Remedies," R. W. Ropiequet, Belleville, Ill.

"The Future of the Coal Export Industry and the Necessities for Its Success," J. A. Renehan, New York City.

Section on Uniform Mining Legislation

The program for the meetings of this section has been arranged by the Illinois Accident Commission, at whose request the Governor of Illinois called for the appointment of delegates from all coal-producing states. The program follows:

Monday Morning, Nov. 13—10 A.M.

"Call for Conference," R. J. Wilson.

"Reasons for Calling Conference," J. G. Grossberg.

"What Can Uniform Mining Legislation Hope To Accomplish," Van H. Manning.

Monday Afternoon, Nov. 13—2 P.M.

"Advisability of Preparing Mining Legislation Through Commissions," S. A. Taylor.

"Commission Plan in Ohio," W. R. Woodford.

"Commission Plan in Illinois," A. J. Moorshead.

"Desirable Points of Similarity," J. E. Williams.

"Commission Plan in Indiana," Michael Scollard.

Tuesday Afternoon, Nov. 14—2 P.M.

"Relation of Federal Government to Uniform State Legislation," Hon. M. D. Foster.

"Uniformity in Miners' Certificates Laws," H. Fishwick.

"Uniform Compensation Laws," K. U. Meguire.

Tuesday Night, Nov. 14—8 P.M.

"Suggestions Regarding Unifying State Laws," Judge J. W. Thompson.

"To What Extent Is It Advisable to Control Mining Operations by General Laws?" R. A. Shiflett.

"Coal Freight Rates—Relativity and Uniformity," R. W. Ropiequet.

Wednesday Afternoon, Nov. 15—2 P.M.

"The Federal Trade Commission and Uniform Mining Legislation," E. N. Hurley.

"Uniform Mining Laws as Affecting Safety First," E. O'Toole.

"Uniform Legislation as Related to the Mine Inspection Service," John Bohlander.

"Uniform Legislation as Affecting Mining Engineering," J. A. Garcia.

Public Lands Section

No set program will be arranged for this section to be composed of special delegates appointed by the Governors of the Public Land States. Its purpose is to agree upon those fundamental principles which can receive the indorsement of all Western interests concerning Federal Public Land legislation and to inaugurate plans by which the policy agreed upon may be made effective.

The Dodson Coal Co. Puts Precepts Into Pay Envelopes so as to urge safety on its employees. A small yellow card is used. It says: "Don't carry a drill on your shoulder where a trolley wire is used. Don't ride on the side or between the cars and do not lean over the cars when riding a trip. Don't attempt to get between cars for any purpose when the cars are about to bump. They may jump the track and squeeze you."

New Apparatus and Equipment

Improved Air Compressor

Many improvements in air compressor design have been introduced by the Sullivan Machinery Co. during the past twelve months. These include a twin design for angle compound compressors, either belted or direct-connected; "plate" air valves of a distinctive pattern and three-pass counter-current intercoolers.

The twin angle compound compressor as the name implies, consists of two complete Sullivan air compressors of the angle compound type, set side by side on a common foundation and driven by a common shaft. As in the single units of this class, the intake cylinders are horizontal, and the high-pressure cylinders vertical. The intercooler is horizontal and is supported by the low-pressure cylinder and its frame. The connecting-rods for both members are attached to one crankpin.

As shown in Fig. 1, the common driving shaft is provided with couplings at each end, so that either compressor may be cut out in case the amount of air needed over a considerable period is less than one-half the total capacity of the machine. The belt pulley, or in the machine illustrated the motor, is supported on an independent frame and on independent bearings.

The air intake for each half of the machine is independent, and each intake cylinder is equipped with a standard double-beat, total-closure unloading valve.

The high-pressure cylinders are also equipped with unloading valves. When the automatic unloaders on the intake cylinders close, and after the high-pressure cylinders have pumped out the air contained in the inter-

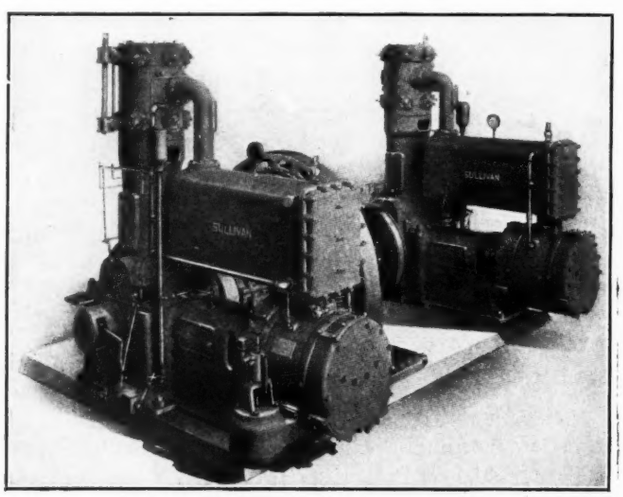


FIG. 1. THE TWIN ANGLE COMPOUND COMPRESSOR

coolers (which requires only a few seconds), the unloaders on these cylinders open communication with the atmosphere, so that small quantities of air leaking in around the valve stems and piston rods are discharged to the atmosphere without being compressed. This prevents heating of the cylinders and maintains a nearly perfect vacuum, in which the pistons move when the compressor is unloaded. Crosshead pins, crankpins, guides and other connections are thus entirely relieved from the friction to which they would be subjected in case any pressure remained in the cylinders during the unloading period.

The chief object in perfecting the twin angle compound design was to provide a compressor of elastic capacity, capable of advantageous operation at any portion of its piston displacement.

The capacity of the plant may be halved by removing the bolts which hold the couplings together, at either end of the shaft, thus allowing one-half of the machine to stand idle. The other half, consisting of a complete, independent two-stage compressor, then operates at full capacity and efficiency as before. If desired, for short

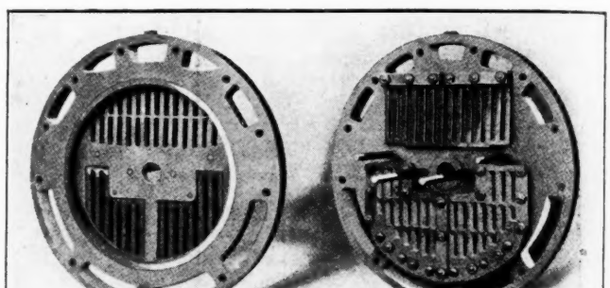


FIG. 2. VALVES AND VALVE CAGE

periods, the same results can be obtained by closing one of the inlet unloaders by hand. The unloaded compressor then turns over without compressing any air, until full capacity is again required.

If only one-quarter of the full capacity is sufficient for the conditions, as in mine development, starting a contract or opening a quarry, one side of the unit is uncoupled and one intake valve removed from opposite ends of the cylinders of the remaining side. This reduces the power required for operation as well as the air delivered. For three-quarter load both sides of the plant would remain in commission, but on one side an inlet valve would be removed from each cylinder. The regular unloaders, of course, provide complete elasticity of output at all times, on whatever basis the plant may be operating. The adjustments referred to are only made when the requirements suggested in the foregoing are to obtain for days or weeks at a time.

The advantages of a multi-unit air plant are thus fully realized in this one machine. When the demand for air is light, one unit can be cut out, leaving the other operating at full load; or one side can run at full load and efficiency, while the regulation is applied to the other only, to meet varying demands. This arrangement, coupled with the power economy of the total-closure system of unloading, forms an almost ideal design of compressor for those districts where power is sold from a central station on contracts based on a five-minute peak load during a given month. Under these conditions air users in the past have in some cases purchased compressors con-

siderably larger than actually required, simply to avoid the high five-minute peak load with its penalizing power bill.

Another interesting feature of the twin angle design is that it enables the plant to run at the same speed as a single compressor. Two hundred and fifteen revolutions per minute would be considered out of the question for a cross-compound unit of 2,200 cu.ft. capacity; but the 1,100-cu.ft. single angle compound compressors, of which this twin machine is made up, operate with complete satisfaction at this speed, and their piston speed is relatively low so that abundant opportunity is afforded for the flow of air through the valves. The wear on the reciprocating parts is slight.

As stated, the pulley or motor and the part of the driving shaft between the two compressor units are supported by separate stands and independent bearings. These bearings are adjustable both longitudinally and vertically. This is a particularly important consideration in motor-driven machines. None of the weight of the motor is supported by the compressor bearings proper, so that the danger of motor destruction from burnt-out bearings is greatly reduced. A separate lubrication system is also provided for the motor bearings.

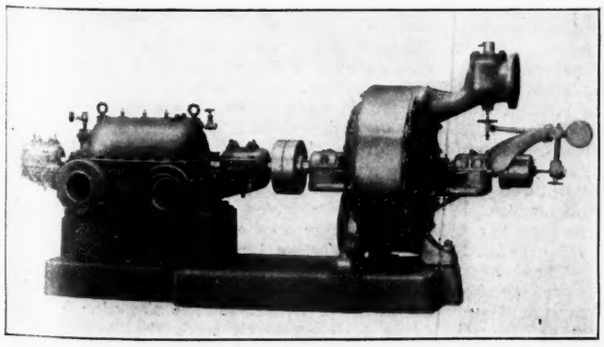
The characteristic features of single angle compound compressors, such as balancing of reciprocating parts, with resultant smoothness of operation and power economy, small floor space, accessibility, etc., inhere also in the twin angle compound type. These machines are built in five standard sizes with a full load rating of 900, 1,300, 1,500, 1,800 and 2,200 cu.ft. of free air per minute. These twin angle compound compressors are in extended service under varying working conditions, and have justified the expectations of their designer.

Centrifugal Boiler-Feed Pump

The development of the steam turbine and the high efficiency multi-stage centrifugal pump have gone hand in hand, but up to the present it has not been entirely practicable to reconcile the speeds of the two machines so that each would work at its best efficiency.

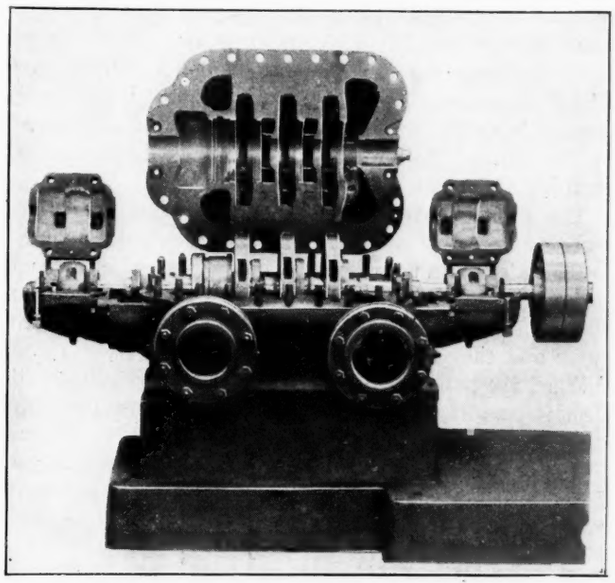
It was necessary, heretofore, either to reduce the speed of the turbine and sacrifice much of its efficiency, or else speed up the pump with similar results. To overcome this difficulty, the Cameron Pump Works, 11 Broadway, New York City, has designed and built a multistage centrifugal pump known as the "BT" type.

The accompanying illustrations show one of these three-stage pumps. The high-speed feature is a virtue of the impeller design. With the ordinary impeller the diameter cannot be reduced sufficiently to get high speed without sacrificing vane length, and consequently efficiency, for a certain vane length is necessary in order that the impeller perform its function without excessive loss. Small external diameter and adequate vane length are obtained in this pump by bringing the vanes well down into the impeller hub, at the same time so turning them that the incoming water is guided smoothly and with little loss into the outer portion of the vane where the velocity is generated that is finally converted into pressure by means of the external diffusion vane. Additional advantages in the small impeller are light weight and low fiber stresses in the material.



PUMP CONNECTED TO STEAM TURBINE

The casing is divided along the horizontal line. Both the suction and discharge connections are in the lower half of the casing. The upper half is readily removable, giving full access to the revolving element. Suitable openings are provided for draining the pump and for displacing the air when starting. Inlet and outlet nozzles can be arranged either on the same or opposite sides—an important advantage where pumps are installed in limited space.



PUMP WITH HALF CASING REMOVED

Each impeller is cast in one piece and is of the inclosed type. Surrounding each impeller hub is a pair of rings—one stationary, attached to the casing, and one revolving, attached to the impeller. By the use of double rings instead of a single ring, it is possible to restore the initial tightness of the joint between the low- and high-pressure sides of each stage without any fitting whatever, whereas a new single ring would have to be of special diameter, and then fitted to the impeller hub, or the casing, to make a tight joint.

The diffusion ring surrounds the impeller at its periphery, although it is not in contact with it. It contains a series of openings which receive the water from the impeller at high velocity, and by means of gradually increasing area toward the periphery, transforms the velocity into pressure and enables the water to advance to the entrance of the next impeller with much less loss of energy than would be the case if the high velocity of ejection were maintained.

To take care of thrust, which manifests itself in all multistage pumps, this machine is equipped with a sim-

ple internal hydraulic balancing device. This device consists of a revolving disk attached to the shaft at the inboard or high-pressure end. Opposite this disk is a stationary drum of the same diameter. Water at high pressure connects with the space between the disk and the drum, causing the disk to act against and oppose the thrust, neutralizing it and holding the rotor in proper relation to the casing. The slight leakage involved in this process is piped back to the suction.

On this pump there are two ring-oiled bearings, self-aligning, one located on each side of the casing. The bearing bodies are horizontally split, with removable caps, and the bushings are also split and lined with high-grade bearing metal. Bushings and bearing bodies have a spherical fit, automatically maintaining the alignment of the shaft. The bearings are of ample proportions to prevent heating, and the oil chamber is of liberal capacity. The bearings are supported by strongly ribbed brackets, cast integral with the lower half of the casing, thus counteracting any possible tendency toward even slight vibration. These brackets are located sufficiently distant from the stuffing boxes to permit of adjustment of the glands. Felt washers are provided to prevent oil escaping from the bearings.

The stuffing boxes are deep, and provided with water seals, consisting of a lantern gland in each box connected to the water from the discharge side of the pump through a passage, so arranged that it can be readily cleaned. The stuffing-box gland is fitted with swing bolts to give quick and easy access to the stuffing box.

When the pump is direct-connected, it is supplied with a shaft coupling of the flexible type to compensate for any slight variation in alignment.

The bedplate under the pump is of one-piece box construction heavy enough to give a rigid support, and with cross-ribs to prevent distortion. In the second illustration this pump is shown with the half-casing raised.

It is claimed by the manufacturers that it occupies less space than the ordinary boiler feed pump of this general type, and that it will give a much higher degree of efficiency.

THE LABOR SITUATION

The presidents of the three districts of the anthracite mining region have been asked whether there is any truth in the statement that the miners are taking more holidays than usual. Of course they deny it. However, it is the public that is to blame for this misstatement and not the Anthracite Bureau of Information. The declaration of the latter has been that the miners, despite the shortage, are taking more holidays than the contract allows, and that the union has aided and abetted in the keeping of one holiday—Mitchell Day—in violation of the contract.

The real trouble has been the frequency of strikes, and these the union officials know and admit are in plain violation of the agreement. Had the mine workers kept their contract relative to holidays, the reduction in output would have been less obvious; and if they had done as they agreed and forebore to strike or even had they struck only when they could allege a grievance, that is, if they had not struck for the 100 per cent. union, we would have been better supplied with hard coal this year than last. As a matter of fact the anthracite operators are unable now and are still more likely to be unable hereafter to supply the demand for fuel, unless the miners make up their minds to work more steadily and for a full 8-hr. day as the contract requires. The introduction of the 8-hr. day, which has not replaced 10-hr. lassitude by 8-hr. intensity, has probably accentuated the situation.

The miners cannot avoid the responsibility for the shortage of coal. Last week we recorded the fact that No. 14 and the Nesquehoning operation of the Lehigh Coal and Navigation Co., in the Panther Creek Valley, were idle because the union miners would not work with nonunion men. Now No. 11 mine, with 700 employees, is idle for the same cause, making the idle men number over 3,000. Other operations in the neighborhood are expected to strike during the week.

At the Brookside colliery of the Philadelphia & Reading Coal and Iron Co., located at Tower City, all the employees gathered recently at the mouths of the slopes while a committee of the union went to the office and asked the officials to discharge the ten men who had no union buttons, threatening to quit work unless they did. The company refused to send home the men who were in arrears in the payment of their union dues, and the union men went on strike.

As there are only ten men who are standing against the union, it is thought that the strike will not last long. Rumor has it that the company will not let the strikers go back to work when they are ready, but will discipline them with a shut-down.

Will Discuss Nothing But Contract Provisions

The Rochester & Pittsburgh Coal and Iron Co. has refused to meet the miners. It is the plain duty of a company to discuss the contract with the representatives of the men in the manner the agreement provides, but these men want to make a new contract. They do not hesitate to say that the bond to which the union set its hand and voted for in referendum is not pleasing to them and they want another. Consequently, they do not deserve a hearing.

As the district officials do not support the malcontents, and these men know they cannot win without that support, each local has sent a representative to cajole the district officers, or failing that to threaten them with the same medicine to which Van Bitner in a less worthy cause had to submit. They have met with Thomas Haggerty, a national board member, James King, a national organizer, Pete Ferrara and John Tusko, the district organizers, and presented their demands to the district board at Clearfield. These demands are not those made at first. They were modified in a committee meeting, but they are still violative of the contract. To spur the district committee to action the local members of the union have threatened to call a district convention in which the district leaders would have no part.

In our issue of Nov. 4 it was stated that for some time there has been a strike at the Vintondale colliery on the Cambria-Indiana County line. C. M. Schwerin, the president of the Vinton Colliery Co. under date of Nov. 6 writes: "Our mines were out on strike, but the matter has been entirely settled, and all the miners in town have been back to work two weeks. The trouble makers were all discharged and have left town. At present everything is quiet at Vintondale and our men are very well satisfied."

Davis Miners Share in 10 Per Cent. Advance

Last week it was stated in this department that the Consolidation Coal Co. in the Fairmont region had granted an increase in wage to its men. It now appears that this increase is the outcome of a meeting of the operators' organization somewhat illogically known as the Central West Virginia Coal Operators' Association. The advance is widespread and in it the Davis Coal and Coke Co. participates, the mine workers receiving a 10 per cent. increase—the third advance awarded them this year.

In fact there is no part of the country where the wages of coal mine workers have been so generously increased as in the area including Georges Creek, the Elk Garden-Piedmont district and the Fairmont district. In Somerset County, Pennsylvania, among the larger companies announcing the increase are the Jenner-Quemahoning Coal Co., the Consolidation Coal Co., the Merchants Coal Co., the Brothers-Valley Coal Co. the Knickerbocker Smokeless Coal Co. and the Baker-Whiteley Coal Co. The number of men working in the non-union mines in Somerset County is slowly but steadily increasing.

Oklahoma is still on strike. President D. J. Jordan, of the Oklahoma Coal Operators Association, has declared that the operators will make no concessions. They will probably continue to keep their mines closed and will not try to break the strike with imported labor. The miners for the most part have not removed their tools, as they do not expect a long strike. Whether they look for a weakening of the operators or for a break in their own ranks is not clear. They evidently anticipate an early settlement one way or another.

There are 17 small independent companies employing in aggregate 350 mine workers which have signed the wage agreement and are now operating. There are also 9 larger companies which are still affiliated with the Southwestern Coal Operators' Association and so have accepted the agreement. These latter employ altogether 900 mine workers.

Recollections of a Manager

During the first weeks following my appointment as manager, I received several anonymous letters; to be more exact, I received several from each of the company's camps, with the single exception of the camp from which I had been promoted. The writers of the letters felt it to be their duty (taking them at their word) to warn me, I being a stranger, against the traitors in the company's employ. The traitors mentioned in the letters were not confined to any single class of men, but included every rank from superintendent down to boss driver, not even the commissary men and the company physicians being overlooked.

This experience brought back very vividly the days immediately following my appointment as mine superintendent, when anonymous letters began to reach me in mysterious ways, and within a week I had been warned against every employee in my organization. Such letters have never appealed to me, and I promptly decided to let it be known that I intended to take steps to locate the authors of all such communications. The news traveled quickly, and during the remainder of my career as superintendent I never received another unsigned letter.

The passing of the years had not changed my feeling toward anonymous letters, and my first impulse was to throw them all into the waste basket. I reconsidered, however, and the letters criticizing my superintendents I retained, while the others I forwarded without comments to the superintendents employing the men mentioned in the respective letters.

At the next monthly meeting of superintendents, I brought up the subject of anonymous letters for discussion, and it developed into a most spirited meeting. Not one volunteered a good word for the writers of anonymous letters, but a superintendent arose to state that such letters had been of considerable service to him.

He had found in his experience that the man attacked by an anonymous letter generally deserved part of the abuse given him, and if the letter was turned over to him at an opportune time he would profit by the criticism. Furthermore, the man writing the letter must have decided in his own mind that he was next in line for promotion to the position occupied by the man whose scalp he was after. But for the anonymous letter its author would probably have reached the coveted position in time; now thanks to that very letter the mean streak in him would soon become exposed, and he would be eliminated from the race.

The argument seemed reasonable enough, and several superintendents suggested that they would give them consideration in the future.

That led me to suggest that all the letters under consideration passed through my office, and although I did not object to passing them down the line when they came into my hands, still I felt that unless I let it be known that I looked upon such letters with disfavor my mail would soon be flooded with them.

That statement did not seem to be very impressive, but fortunately just then I happened to recall the letters that I had retained in my files warning me against the superintendents. I got them out and gave them to the ones whose names they mentioned.

If a single one of the superintendents present was willing to admit that he deserved the abuse directed at him in any of the letters he kept it to himself; furthermore, the meeting lost its enthusiasm.

After that meeting I received few anonymous letters, thanks to the activities waged against them by the various superintendents.

The Many Recent Explosions

Explosions have been unusually frequent in the coal field in the last few weeks after a period on which we had every reason to congratulate ourselves. An extremely severe explosion occurred Oct. 19 at Barrackville, W. Va., another happened at Marvel, Ala., Oct. 22, a third at Eleanora in Pennsylvania on the same day, a fourth at the Lytle Colliery, Oct. 24, and now one at the Bessie Mines No. 4, at Maben, Ala., one of the operations of the Sloss-Sheffield Steel and Iron Co.

The frequency with which these explosions take place can hardly be attributed to the approach of the winter season, for the mines have hardly dried by this time. It may well be due to the press of business, which may have caused some precautions to be overlooked, though the Eleanora explosion had no such probable cause. A full account of the Bessie explosion will appear in *Coal Age* next week.

IN LIGHTER VEIN

Peculiar Pump Priming

W. H. Perdue, of Elbert, W. Va., tells a story of an old pumpman from Pocahontas, Va., who followed a rather unusual plan of priming a pump that failed to catch water. The old pumpman lived at "Poca" and had an ancient pump that had to be primed with tar. So one night he and the night boss were trying to get it to pump and had used all their tar. They didn't know what to do, and after trying about a dozen different plans, the pumpman picked up a stick and went to where they fed the mules at noon and killed six rats. He came back and started priming the pump with rats. Thereafter, he never worried about tar for that old pump would catch water on anywhere from five to six rats.

Mr. Perdue won't vouch for the truth of the story. However, he believes that some of the readers of *Coal Age* who may have a "tar-primer" might be able to use this method to good advantage—if it will work.

COMING MEETINGS

Tenth Chicago Cement Show at Coliseum Feb. 7 to 15. Secretary, B. F. Smith, 210 So. La Salle St., Chicago, Ill.

Kentucky Mining Institute will hold its winter meeting on Dec. 8 and 9, 1916, at Seelbach Hotel, Louisville, Ky. Secretary, Ivan P. Tashof, 437 21st St., S. E., Washington, D. C.

The American Concrete Institute will hold its annual meeting at the Hotel La Salle, Chicago, Ill., Feb. 8-10, 1917. Secretary, Harold D. Hynds, 1418 Walnut St., Philadelphia, Penn.

The Coal Mining Institute of America will hold its annual meeting on Wednesday, Thursday and Friday, Dec. 6, 7 and 8, 1916, at the Fort Pitt Hotel, Pittsburgh, Penn. The annual dinner of the Institute will be held on the evening of Dec. 6.

Illinois Mining Institute will hold its fall meeting Nov. 25, 1916, at Springfield, Ill. All those interested in coal mining should attend this meeting. A fine program has been arranged, the banquet in the evening being held at the St. Nicholas Hotel. Secretary, Martin Bolt, Springfield, Ill.

Editorials

The American Mining Congress

It is whispered that the American Mining Congress is an organization seeking its end through political action. Since when did this become an indictment? We frequently claim that the political constitution of the nation has been the cause of all the happiness we enjoy as a people. It is not quite true, of course. We must save a little credit for the excellence of the stock composing our citizenry and for the mineral wealth and fertility of the land on which and in which we live, but even subtracting these there is a large residuum due to the excellent laws under which we have lived.

The people believe they can be bettered; some, they think, could hardly be changed for the worse and others though not so badly planned are susceptible of changes which would make them less harassing. It is the work of the American Mining Congress to seek the rectification of such laws when they apply wholly or in part to the business of mining.

As a matter of fact the technical side of an industry may not be its most important phase, and often its success technically rests on the political conditions under which it is conducted. An industry working without profit has no money to expend for experts or technically trained men, nor appropriations for research, nor funds for experiment. It continues in a narrow groove year by year, its technical advance and its social progress being stunted.

The American Mining Congress furnishes a means of bringing before the Government at Washington and before the nation the needs of the industry. It discusses in an open way the purposes of mining men. If the public knew the industry better, it would be far less exacting.

In these days too many of the newspapers of the country misrepresent every issue. They subordinate the truth too frequently to a desire to please the reader. The American Mining Congress serves to enlighten the public as to what the needs of the industry are, to provide facts, which are not distorted by ignorance and prejudice. For strange to say, operators, though their judgment is somewhat biased, are so closely confronted with the cold facts that they are far less likely to misrepresent the truth than a public which is ill-informed and is willing to believe anything that it is told, and ready to reward gratefully anyone who will lie to it in any interesting and not too improbable a manner.

As an evidence of the fact that the public is more untruthful than the leaders of the coal industry have ever been, may be adduced the fact that nowhere is the industry assailed by the people who live near it so forcibly as by those who live far away from it. If you want to see the mine operators properly spitted you must read the New York or Philadelphia papers. Reputable papers in Pittsburgh, Birmingham and other coal cities never venture to utter so many untruths. In fact much of the inveracity of the papers in the two eastern cities is entirely due to ignorance of conditions.

Something has recently changed the editorial policy of these papers. There may be several causes, but one undoubtedly has been the trip of the editors through the hard-coal region and the friendly coöperation of the Anthracite Bureau of Information.

The invitation of the American Mining Congress to the public in general is another way in which the coöperation of that public may be obtained. It is another declaration that all we need is a fair hearing and an unbiased judgment. If there is anything about the methods of the business which will not stand inspection, we are all willing to have it removed. We are quite willing to make living conditions hard for the crooks. We are all anxious that equal laws shall be passed in all the states for the safeguarding of life and recompensing of the injured. We would all rather see the industry working steadily 300 days in the year and making a reasonable profit at all times in place of a feast now and a famine at another time. If we fail in these aims, we want the public to know why. We ask it to help. This is the significance of the Congress. If it fails, it will not be because it lacks a worthy and legitimate purpose.

A Square Deal, Please

The past week has witnessed the inception of various investigations into the high price of coal by Federal, state and municipal authorities. The secret service is said to be quietly at work in New York City collecting data for the District Attorney's office, while other investigators are poring over the books of the big companies in the attempt to run down some evidence of a conspiracy to maintain prices. Aided by two or three metropolitan dailies, unscrupulous or misinformed politicians are seizing upon the unfortunate situation now prevailing to ingratiate themselves with the public by denouncing the "coal barons."

Coal Age holds no brief for any so-called fuel trust, if such there be, as our readers well know, but we do stand firmly for truth and justice, neither of which is being accorded the industry in the hysterical wave of mud slinging now sweeping over the country.

It would seem that the time has arrived for the coal men to show their teeth instead of submitting tamely, and even assisting these investigators in their work. Let the mine operator, for instance, demand a Governmental investigation of the high price of the steel rails he is using in his mine. Carnegie amassed a fabulous fortune in steel on profits of a few dollars; today the steel mills are making profits of $25 to $50 a ton. And let the coal salesman demand an explanation of why those shoes he wears out, so patiently seeking orders, have advanced from $5 to $8 a pair.

The present hue and cry is especially irritating when one considers that the fault lies primarily with the public itself, and secondarily with the railroads. It has been demonstrated time and again that the transportation facilities of the country are inadequate to meet the peak load occasioned by a severe winter. On the other hand,

it is a well-known fact that if the mines were given a free swing, they could output 50 per cent. more bituminous coal than the burning capacity of the country.

It is further exasperating when one considers the strenuous effort the operating interests make to avoid this occasional inflation of the market instead of devising a means for bringing it about, as is the popular conception. The mining men will feel that Utopia has been attained if they ever succeed in prevailing upon the consumer to store his winter supply in the summer. It will mean a demand for his product when plenty of cars are to be had, orders for the mines when weather conditions are favorable, and when it is difficult to keep the working organizations intact.

The keenest brains in the industry have long wrestled with this problem of devising ways and means for inducing summer stocking. Schemes of the most subtle kind have been practiced to trick the public into protecting itself. After all it is purely a psychological condition; who, for instance, would consider purchasing a heavy overcoat on a broiling hot day in July?

As to investigations, the coal industry will welcome them. And we hazard the prophecy that the investigators will find a most impressive array of bankruptcies to the credit of the industry.

The Situation in Anthracite

Owing to front page publicity in the newspapers the general public is taking keen interest in the coal shortage, and all sorts of threats are being made of more investigations. In the meantime the retail men's stocks grow smaller as shipments become less frequent.

Opinions vary as to the actual cause of the present situation, but those in close touch with the market know there is a serious shortage of anthracite. It cannot be denied that the demand at this time is only comparable with that of the 1902 strike. Also it has been years since the production was so small at a period when every effort was being made to put out a maximum tonnage. The summer's production was in excess of other years, but operators usually make no effort to work full time in the summer, because of a lack of orders. This year, with an abundance of business and every nerve being strained for tonnage, the output with some operators is running as much as 10 per cent. below normal.

Then the storage yards that usually contain millions of tons are now practically empty. This source of supply is seldom referred to on account of a prejudice against storage fuel, though even during a normal winter there would be actual suffering if these stocks were not available. As a specific instance we know of one company which usually stores 700,000 to 800,000 tons and today has only 70,000 tons of nut and pea sizes.

The car shortage, too, is a serious question, but as long as empty cars continue to stand on dealers' sidings for days at a time, it seems apparent that the shortage of motive power is just as serious. The fact also that the larger proportion of the current output is going to the North and West is a big factor in the car shortage, owing to the time required to make the extremely long hauls.

While there may be no actual suffering for coal later in the year, it is obvious that the shortage of coal will be such as to render the situation serious at times. This conclusion is based on facts that must be accepted. In the first place for over a month and a half beginning with Apr. 1 last there was an extremely small tonnage of coal produced on account of the negotiations for a new working scale. The mines were nominally at work, but because of the uncertainty as to prices very little coal was moved.

The shortage of labor is also growing more ominous, being at this time between 70 and 80 per cent. of the demand, while the production is further restricted by the shortened day. In addition the frequent local or "button" strikes are in the aggregate most serious. This week, for instance, one of the large companies had 2,500 men idle an entire week on this account, and in another case 2,000 men have just returned to work after being idle for a week.

The car supply all over the country is more serious at this time than during the similar period last year. Last of all there is the greater demand for fuel on account of industrial plants working night and day, together with the lack of economy of the public in general, who in these prosperous times do not stint themselves in the use of coal. Yet even with this alignment of stern facts there is some consolation in remembering that there has been no time in the history of the country when we did not manage to come through the winter in fair shape, and we are optimistic enough to believe that even this year will be no exception, serious as the situation is now.

Illinois Coals Breaking into New Markets

The demand for Middle Western coal for Eastern points is something abnormal. During last week almost 300 cars of screenings moved out of the Mount Olive field to Detroit at not less than $2 a ton at the mines. An exceedingly heavy tonnage has also moved to Indiana points from the field adjacent to St. Louis, and reports have it that some coal has moved as far east as Sandusky, Ohio, and Buffalo, N. Y., and in one case a shipment of screenings was made to a central New York point. A comparatively large amount of free tonnage has moved to Michigan points at fancy prices. Shipments of both steam and domestic sizes at high prices are being made to Chicago from the Fulton and Peoria districts, and from northern Illinois.

The situation in the Northwest has reached a serious stage, and several shippers have advised the trade that they are entirely out of the market. The railroads serving the docks have not been able to supply sufficient cars to take care of orders on file, and some of the dock companies have orders as far back as September still unfilled. The supply of coal on the docks is less than normal, which, supplemented by a car shortage thus early in the season, is causing much anxiety as to the outlook for the winter months. Orders are now being taken by the Illinois operators for shipment to Northwestern points subject to prices current at time of shipment.

Calls have also been received for Illinois coal from several Southwestern states because of a strike at the Oklahoma mines which has cut off according to press reports all the production in that state except about 1,300 tons per day.

Department of Human Interest

Were the Demerits Justifiable?

By Thomas Town* and Thomas Massey†

At the first-aid contest held in San Francisco last year, the following team event was among those submitted to the contestants, and the decision of the judges regarding it seems subject to discussion:

Man is overcome by afterdamp and requires immediate removal. He is burned on the hands, arms, neck and face. Carry the patient 10 ft. on an improvised litter. Two of the team at that time are supposed to be overcome by gas, and the remainder of the team carry the patient without a litter 20 ft. to fresh air and there treat him.

The event was also among those submitted at the Wyoming State Meet held at Rock Springs last August, and therefore the correct manner of performing it is a matter of some interest. We understand that the judges in both contests were in favor of the following solution of the questions which arise in connection with the event:

The full team should enter and carry the patient on an improvised litter 10 ft. Two of the team should then be overcome by afterdamp; the other three should carry one man each. The victims should then be brought to fresh air, where artificial respiration should be performed on them. After breathing is restored, the three men treat the first patient for burns.

While we do not for a moment presume to pose as experts in these matters, we cannot help saying that our judgment and practical experience would lead us to believe the following method of rescue a better and safer one:

Two only enter the place and carry the patient on an improvised litter 10 ft. They are then overcome by gas. The three men who have been left at the fresh-air base, prepared for just such an emergency, then enter and each taking one man he brings him to fresh air. Here they perform artificial respiration, and after breathing has been restored one man is left with the two who have been overcome, to guard against the possibility of a relapse, while the other two treat the first patient for burns.

The claim was that in performing the event in the way described we disregarded the exact reading of the instructions, inasmuch as one full team did not enter the place at once as provided. The question is whether a literal following of instructions is to be regarded as of more merit than a safe and efficient meeting of the conditions presented.

We believe that the most important feature of a contest is the lessons that it teaches. If the description of the event tends to lead to false practice in rescue work, it would be better not to follow the directions too closely. The judges, if not mining men themselves, should certainly consult with experienced mining men before giving their decision, for the problem of rescue is only in part one for the medical profession. The work of removing men from the mines involves conditions regarding which doctors know little or nothing.

All those who attended at San Francisco and Rock Springs naturally think that the method recognized by the judges at those meets is the one to be pursued in actual mine-rescue work. But probably not 10 per cent. of the judges at San Francisco would have known how to act in such an emergency.

It is not advisable surely for five men to enter a place to carry out one man where there is afterdamp to contend with. Supposing that the three supernumerary men were able to withstand the afterdamp, is it likely that they would have strength enough remaining to carry out the victims, enfeebled as they were by the breathing of the foul air at the face? Would they be able to perform artificial respiration and to bind up the burns of the first man? Furthermore, is it justifiable to leave two men alone who have just been restored by artificial respiration and who are likely at any time to suffer from a relapse?

*Fireboss and first-aid instructor, Hanna, Wyo.
†First-aid instructor, Hanna, Wyo.

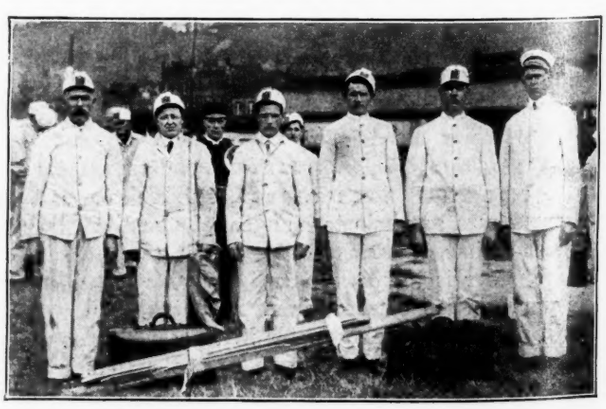
Jellico, Tenn., First-Aid Contest

By Philip Francis*

On Oct. 21 the Fifth Annual Miners' Field Day and First-Aid Contest was held at Jellico, Tenn., attended by about 2,000 persons. The teams formed in line of march at the Union Station, led by the Pruden Coal Co. band under its director, Charles Townsend. The procession marched to Railroad Park, which is situated in front of the City Hall.

*Superintendent, Proctor Coal Co., Jellico, Tenn.

LICK BRANCH COAL CO.'S TEAM FROM COXTON, KY.
Took first prize, beating all Tennessee and Kentucky teams

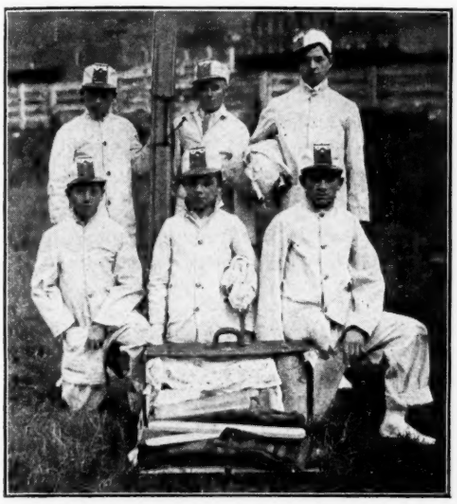


PRUDEN COAL CO.'S TEAM FROM PRUDEN, TENN.
Awarded second prize and Tennessee Cup

Judging and grading of the teams was under the management of Dr. L. M. Scott, of Jellico, Tenn., assisted by Dr. Bowyer, of Stonega, Va., Dr. Howard, of La Follette, Tenn., Dr. Boone, of Coxton, Ky., and Dr. Linzee, of Pruden, Tenn.

There were five events: A one-man event, a two-man event and a three-man event and two full-team events. Prizes were awarded on the general average of the work in all five events.

The first prize was $60 cash and six Justrite lamps and was won by the Lick Branch Coal Co. team, from Coxton, Ky. The second prize was $54 cash and six cans of National carbide and fell to the Pruden Coal Co., of Pruden, Tenn. A silver loving cup was also awarded to this team by the Southern Appalachian Coal Operators Association, in recognition of the fact that it was the best Tennessee team on the field.



BOYS' TEAM FROM PRUDEN, TENN.

Secured fourth prize. Some of the boys are of foreign birth and speak indifferent English

The third prize was $48 cash and one box of cigars and was won by the Westbourne Coal Co. team, Westbourne, Tenn. The fourth prize was $42 cash and one box of candy and was won by the boys team of Pruden, Tenn. The boys did excellent work, competing with adult teams some of which had been entered in contests for the past four years. Their success was the more creditable as this was the boys' first contest. The boys were trained by Rufus Speaks, the foreman of the Pruden Coal Co. Their work is a splendid example of what can be accomplished by effort and persistence in trying to educate the foreign miner, for several of the boys on the team were of foreign birth and could scarcely speak English.

The fifth prize was $30 cash and one Stetson hat and was won by the Knox Mining Co. team, Rockwood, Tenn. In the Tennessee contest a year ago, the Knox Mining Co. team won first place. The sixth prize was $30 cash and was won by the Pruden Coal Co. team. The Pruden Coal Co. had three teams entered in this contest. The seventh prize was $24 cash and was won by the American Zinc Co. team, Mascot, Tenn. The eighth prize was $20 cash and was won by the La Follette Coal and Iron Co. team, La Follette, Tenn. The ninth prize was $18 cash and the tenth $15 cash. The Proctor Coal Co. team, of Red Ash, Ky., and the Durham Coal and Iron Co. team, of Durham, Ga., tied for the ninth and tenth prizes. They pooled the money and divided evenly. The eleventh prize was $12 cash and was won by the High Cliff Coal Co., Pruden, Tenn. The twelfth prize was $9 cash and was won by the Southern Mining Co. team, Tejay, Ky.

PRUDEN (TENN.) BAND OF 17 MUSICIANS

As there were only twelve teams entered, there was a prize for each team, this being the first of these annual contests in which all the teams received a prize.

At the close of the competition the teams went to the lecture room of the new mine-rescue station, and were given a free dinner by the citizens of Jellico, Tenn., served by A. W. Griffin.

After luncheon J. N. Finley, general manager of the Proctor Coal Co., addressed the teams on safety and first aid. The prizes were awarded by Philip Francis, superintendent of the Proctor Coal Co. Among the mine officials from out of the state were J. E. Williams, superintendent of the Lick Branch Coal Co., of Coxton, Ky., J. N. Finley, Williamsburg, Ky., and C. W. McMillan, superintendent of the Durham Coal and Iron Co., Durham, Ga.

J. T. Moore, of Jellico, Tenn., A. W. Griffin and V. M. Hacker of Knoxville, Tenn., Charles Griffith, of Pruden, Tenn., and Philip Francis, of Jellico, Tenn., worked hard to make the contest a success. J. M. Webb, of the United States Bureau of Mines, instructed the first-aid teams.

Institute Session Held Despite Flood and Cold

The field work of the mining extension department of the West Virginia University, which was suspended during the summer months, was resumed early in September. The miners of the several districts where the work is carried on are now following the lectures with renewed interest.

Because of the great disaster occasioned by the flood of Aug. 9 on Cabin Creek and Coal River, the extension work in these districts has been somewhat hampered; but it is gradually being reorganized. On Oct. 11 the most remarkable meeting of any yet conducted by the representative of the mining extension department in the Kanawha fields was held at the mines of the Cabin Creek Consolidated Coal Co., at Kayford on Cabin Creek. The steam plant that supplied heat for the church in which the miners' meetings are held was put out of commission by the flood, and weather conditions were such that the meeting of that night could not be held in the church without heat. It was resolved, however, that the initiatory meeting of the year's work could not be postponed without considerable injury to the institute.

The program for the evening was to be an illustrated lecture on "Topics of General Interest." Notices announcing a "Campfire Lecture and Smoker" were posted. In the evening a large bonfire was built on the débris left by the flood in front of the country store. The curtain on which the lantern-slide pictures were to be displayed was hung on a box-car which happened to be standing on an adjacent track.

A generous supply of cigars furnished by Josiah Keely, general manager of the company, was distributed among the miners who had assembled. While J. J. Bourquin, who has charge of the extension work in this district, proceeded with his discourse from the store platform the men gathered around the camp fire, enjoyed their smokes and the illustrated lecture amid the ruins left by the phenomenal flood.

Mining institutes are being organized at several stations in the Kanawha fields; night schools are to be conducted in connection with the lecture course provided by the university, and it is believed that a work which will redound greatly to the good of the miners, the coal-mining operators and the state will be accomplished by the West Virginia University during the coming winter months.

Discussion by Readers

Technical Writing

Letter No. 2—I read with pleasure the article on the "Advantages of Technical Writing," *Coal Age,* Oct. 7, p. 568, and, while most of that writer's experience coincides with my own, I have failed to come in contact with those who, as he remarks, hold such work in contempt. Perhaps this is because I seldom mention the matter of writing among my associates, and remarks of friends have always been complimentary rather than otherwise. The writer of the article to which I have referred suggests that this contempt may arise either from a feeling of envy or because the person is foolish enough to believe that it is better to keep one's knowledge to himself and use it for his own personal gain. We hardly need to concern ourselves with the first of these motives, as we should be consoled with the truth so often stated that "every knock is a boost." If this is true, we can extract our grain of comfort as the tribute that envy must always pay to merit.

In regard to the second motive, the man who hugs a technical secret to himself reminds me of a character in a book I read some years ago. The man hoarded his bank notes for years, and when these finally became the possession of his son they were found to be worthless, being drawn on defunct institutions. In the same manner the man who hoards a pet theory comes to find later, when attempting to apply it in practice, that it is valueless because someone has found a better way.

One of the great advantages in writing is that it promotes accuracy of expression. It drives a man to the library, where he searches for facts and exact figures to support his views and opinions. This means education and compels a man to think. Writing for others makes a man conservative in his statements and fluent in his expressions. In conversation with friends a certain laxity of expression and the exaggeration of facts are generally overlooked, but one's writing gives to strangers who read, a wrong conception of a writer who is not exact in his statements, and says only what he means.

In writing one gains a certain reputation and extends his circle of acquaintance in a way that he could not otherwise. I may be pardoned for mentioning one or two incidents that occurred recently in my own experience. I learned but a few days ago that one of my contributions, published as a foreword in *Coal Age,* had been framed and hung in the office of the general superintendent of a western coal company.

Again, a district mine inspector of Tennessee, after reading the many letters sent to *Coal Age,* in the contest of "Who Gets the Promotion?" wrote me that he was much impressed with the suggestion contained in my own letter, which he regarded as meriting the prize, although I cannot say that I agree with him on that point.

At another time, I was gratified to learn, through a friend, that an acquaintance of his had spoken highly of my contributions to *Coal Age,* which he stated he always read with pleasure.

Thus, the pleasure derived in the expression of one's thoughts in writing often surpasses, in value, the money received in remuneration for his efforts. It is needful that one who writes should be absolutely sincere in his opinions and truthful in his statements. Referring to the suggestion of a club of *Coal Age* contributors, which appeared in the article to which I have referred, I can see no advantage to be gained thereby, although frequent contributors to the paper unquestionably come to form a community of interests that draws them closer together and unifies their aims and strengthens their efforts in benefiting the coal industry. GEORGE N. LANTZ.

New Straitsville, Ohio.

Shortage of Labor in Mining

Letter No. 9—I have been deeply interested in the discussion of this subject and quite agree with those who have expressed the opinion that favorable labor conditions existing in the mines, together with reasonable and humane treatment of the men by the mine foreman and his assistants, are the most important factors in retaining a sufficiency of suitable labor.

Perhaps no other coal-mining state has been so hard hit in this respect as Alabama, but I am proud to say that this does not apply to the district in which I am located. The shortage of labor in our state, however, may be explained as being the result of three chief causes, which are as follows: (1) The large number of negro miners employed, their ignorance of conditions existing elsewhere, and their natural willingness to believe every word told them by labor agents from other states. (2) The bulldozing or petty unfairness with which the Southern miners and, particularly negroes, are treated by the deputy sheriffs—commonly called "shack rousters." Many of these officials are selected on account of their brutality and ability to terrorize the negro. (3) The unjust discrimination in freight rates that permit coal to be transported a distance of 2,000 mi. to an Alabama port and laid down at a cheaper price than is possible in the home trade, where the coal is carried a distance of only 400 mi. to the same market. This condition causes a dull market and many idle days at the mines.

Notwithstanding these conditions and the fact that, as I am informed, over 2,000 colored miners have left Alabama on free transportation, I am happy to say that there is yet a plentiful supply of labor in our district. Indeed, there is scarcely a day passes when I am not compelled to turn away applicants for work. The reason that the pernicious labor agent has not been as successful in this district as elsewhere in the state can be attributed to the fact that the mine workers here are treated as human beings and not as automatons without friends or feeling. Their treatment is even better than they could ask or expect. At the same time they are not spoiled by coddling, but are left to act free and independent, which adds greatly to their self-respect.

The readers of *Coal Age* will be interested to know of one feature of the welfare work performed by coal operators in this district, who are the owners of large tracts of surface lands, which they allot to their employees who wish to keep them in cultivation and for which the owners receive no returns further than the good will of the tenants. In some cases a tenant will cultivate 10 acres, producing therefrom splendid crops. Most of the employees own their own cows and hogs, which insure to them a plentiful supply of meat, milk and butter, which, with the garden vegetables that they raise, supplies them with all that is necessary for food.

It goes without saying that treatment of this kind has and will continue to produce excellent results. I will say that, while Alabama is considered "open shop," the miners in this district are encouraged to present any alleged grievance, which receives prompt attention and is invariably settled with satisfaction to both parties. The district is practically free from the abuses attending the employment of "shack rousters," to which I have referred. As a result, we have been able to operate our mines continuously with skilled and experienced miners.

Kimberly, Ala. WILLIAM CROOKS.

Bonus System in Coal Mining

Letter No. 1—Referring to the question of applying the bonus system in the operation of a coal mine, as suggested in the letter of W. H. Noone, *Coal Age*, Sept. 23, p. 507, and further advocated in the letter of C. S. Schwarz, Oct. 21, p. 686, I conclude that these gentlemen are not operating under a closed-shop agreement with the United Mine Workers, such as exists in Ohio, Indiana and Illinois.

Personally, I am a strong advocate of the bonus system wherever it can be applied. However, in considering the question of applying this system to the mining of coal, we must have due regard to the conditions that invariably exist in unionized mines, since such mines form a considerable part of the industry.

BONUS SYSTEM IN UNIONIZED MINES

My experience teaches me that the bonus system cannot be applied to mines operated under union contracts. The officials of organized labor are unconditionally opposed to a system that has a tendency to speed up employees. The results that would inevitably follow the inauguration of a bonus system in a union mine would be a demand, at the expiration of the existing contract period, that the maximum wage earned under the bonus system be paid to all employees doing the same class of work.

I fail to recall a single instance where the bonus system has been applied under the closed-shop conditions required by our union contracts. The principle involved is that any employee who performs work having a higher wage scale must be paid that wage whether he is competent to perform the work or only 50 per cent. of it. Also the slightest precedent established at any one mine in a district will be fixed on that mine in the next agreement with the union.

In the face of these conditions, the suggestion of Mr. Schwarz, that the system should be flexible so as to increase the producion of coal when the demand was excessive and modified to meet the conditions when the demand was light, is, in my opinion, impracticable to say the least, under union working conditions. The policy of the union is never to permit a reduction in the earning power of one of its members, whether the prices are written in the contract or not.

Minersville, Ohio. WILLIAM W. MILLER.

Letter No. 2—Referring to the letter of Samuel Dean, *Coal Age*, Oct. 7, p. 608, commenting on my suggestion of the adoption of the bonus system for the improvement of the coal industry, I note that C. S. Schwarz has already replied to Mr. Dean, in his letter, Oct. 21, p. 686; but I will take this opportunity of endeavoring to set forth a general outline of the principles involved in the proposed bonus system, as applied to coal mining.

The bonus system that I have in mind would, in my opinion, bring about an improvement in the coal industry, through the coöperation of the workmen whose energies when properly directed to this end might well be awarded with a bonus of a specified amount per day over the regular wage.

The success of a bonus system will depend upon the bonus being conditioned upon an equitable day's work. An effective system must be carefully and intelligently planned, and each important phase of the game must be carefully considered. The ultimate aim and purpose is to maintain a certain margin between the cost of production and the selling price of the coal, while at the same time having equal regard for the safe and sanitary condition of the mine, the improvement of mining conditions and the increase of the daily output.

SUCCESSFUL PLAN MUST BE DEVISED BY MANAGEMENT

I have in mind no Utopian system, the salient features of which would prove a nightmare of costs. A resourceful management will be able to devise ways and means by which a bonus system can be applied equally and successfully to the workers in every branch of its operation. This will be done by each individual management more effectively than is possible through any theorized recommendation. Competent mining organizations will always be able to work out their own salvation.

It is not expected that such a system would be applicable to the cut-throat and suicidal conditions that are implied in Mr. Dean's letter, where he refers to coal being marketed "at a price below the cost of production," or where ten salesmen are doing the work of one. Such primitive—I may say kindergarten—conditions must be combated with more drastic measures. By intelligent action it is possible to reach presidents and sales agents who are responsible for such conditions, but this cannot be done through the bonus system.

BONUS SYSTEM TENDS TO DEVELOP THE COÖPERATION OF WORKERS

I wish to be understood as advocating that a workman shall share in the profits of the coal organization only to the extent that he manifests a coöperative interest in the work in his charge—an interest that will show that he realizes the end designed to be accomplished by the bonus system. Let me illustrate this as follows:

Time and material are the two great sources of cost in any scheme, and the waste of either of these is an enormous item in the success of the operation. Purposeless time and effort is likewise a waste. It is to eradicate such waste and bring about a more efficient working or-

ganization that the bonus system is designed to accomplish, and to do this it must be both elastic and far-reaching.

For example, suppose a motorman is granted a bonus of a specified sum a day, in addition to his regular wage, provided he performs what will approximate an equitable day's work, as determined by the unbiased judgment of the management, such bonus to be payable each regular pay day. It is almost certain that a motorman who has any ambition at all will strive hard for this bonus. It is natural for a man to try to get everything that is coming to him. The success of the bonus system, in its application to other industries, is probably due to the psychological insight into the game by the management in each case.

Practical Working of a Properly Standardized System

If through any fault of the motorman he does not reach this standard set for the day's work, it does not follow that the margin between the cost of production and the selling price of coal is appreciably decreased. The loss of the bonus, in that case, is the motorman's own fault. If breakdowns and delays occur, however, for which the motor crew is not responsible, the fault rests somewhere and someone else is responsible. On this account the system must be elastic enough to apply to all inside work, and the standard set for a day's work for each kind of labor must be determined in accordance with the conditions that are common to underground work.

In fixing these standards due regard must be had to the proper care and oiling of machinery, the equitable distribution of cars and supplies throughout the mine, the avoidance of delays and breakdowns, as far as possible; in short, everything that pertains to transporting coal from the working face to the tipple and loading it into cars for shipment. It should thus be possible to set suitable standards for gathering motors, drivers, trackmen and all others engaged in putting out the coal, who but for the bonus system would often be indifferent to the matter of lowering the cost of production and to questions affecting the safety of their fellow workers. If the bonus system can, as I have suggested, be made to produce greater coöperation it will increase the safety of mining operations and should be tried.

Perfect mining conditions are never brought about through accident, and where they exist it must be conceded that the management and the entire organization are highly efficient. In my opinion the bonus system applied to mining is a possible means of increasing the efficiency of such an organization. When properly adjusted, its effect cannot be to materially increase or decrease the margin between the cost of production and the selling price of the coal. The company is by no means the loser when a bonus is paid to a workman if the system is intelligently planned. Neither does the company gain or lose when workmen fail to earn the bonus offered. In the payment of bonuses there is, I believe, a gain both to the company and to employees who are fortunate enough to merit them. I freely admit that the threshing out of this suggestion is yet in its infancy, and shall be glad to hear from others.

Thomas, W. Va. W. H. Noone.

Heat-Unit System Buying Coal

Letter No. 1—I was much interested in reading the editorial entitled "Is the Heat-Unit System Doomed?" *Coal Age*, Sept. 23, p. 510, and want to join the issue by saying, It should be! My objection to the heat-unit system of selling coal has been born of an experience of many years in the sale of hundreds of thousands of tons of steam fuel.

In the first place, let it be understood that I have the greatest respect for all scientific research as applied to fuel consumption, and it is far from my intention to belittle any of the vast achievements accomplished in that direction; but I do insist that the heat-unit system has failed to place a true value on carload shipments of coal and is equitable neither to the buyer nor the consumer.

I have made a careful study of the several types of bomb calorimeters used in determining the heat value of coal, and while presenting a theoretically ideal method, the difficulties to be overcome in its application are such as to render it, in my opinion, commercially impracticable of general adoption.

The chief difficulty in applying a heat-unit basis to the purchase of coal lies in the fact that coal is not a manufactured article. The operator who mines it must take it as it comes from the earth, with the exception of the preparation it undergoes to remove the slate, bone and other foreign matter. If coal were a manufactured article, such for instance as a roll of woolen cloth, it would be quite reasonable and easy to determine its purity, as it is to ascertain the exact amount of wool used in the manufacture of cloth. But the amount of carbon in a given weight of coal is ever a variable quantity. The ideal fuel would, of course, be pure carbon, or that at least is what the B.t.u. test assumes, but it is beyond human power to produce such a fuel.

The Government the Chief Advocate

The chief advocate of the heat-unit system for the purchase of coal is the United States Government, and I have participated in contracting for the sale of many thousand tons to the various branches of the Government. We have always, however, steadily refused to sell the coal to the Government on the basis established by them, although they are now using large quantities of our coal.

Bids have always been entered at the per-ton price and while, in many instances, our tenders have been refused, we have usually been allotted a portion, because of the difficulty experienced in securing the entire supply on the B.t.u. basis. Frequently, the bids accepted on the analysis basis are from middlemen who are willing to take a gambler's chance that a good proportion of their coal will merit a premium and thus carry them through. We have supplied much of this coal to successful bidders and at times have been actually astounded that some fuels passed the test while others did not.

As already stated, I feel that the heat-unit system is unfair, not only to the mine owner and the large consumer but to the coal-consuming public at large, and will eventually raise prices all around. For instance, the Government sets a certain standard and all coal falling below that standard is rejected. What is to become of the rejected coal? It has been mined and has cost just as much money to produce as the coal accepted. Being a rejected fuel it naturally returns to the general market with a stigma upon it, which lowers its price.

The fact is well known that the large producing companies operating a score or more of mines must depend on their better grades of steam fuels to move those that are not so desirable. I believe that if the heat-unit system ever becomes universal, and only the better grades of fuel are selected, the price increase necessary to compensate for the expense in moving the low-grade fuels will be out of all proportion to any advantage gained by the system. Then, again, the making of the tests is an added expense to the consumer, as they require the use of costly apparatus and the services of skilled chemists.

My experience with the calorimeter is that it is far from accurate, as numerous instances have occurred where cars of coal have passed the test but failed entirely when burned beneath the boilers. Other instances that have come within my personal observation have been the reverse. While the coal did not meet the requirements of the heat-unit test, when burned it fully met all requirements for steaming.

Another fact of which the calorimeter takes no account is the size of the coal. As is well known, when determining the B.t.u. the fuel is reduced to powder. No argument is needed to prove that anthracite pea coal is a far better steam fuel than any of the buckwheats. But, when tested for heat units, the sizes from pea down to the very smallest grade show but slight variation, and this is due only to the fact that the smaller the size of the coal the more difficult it is to remove from it the slate, bone and other impurities.

At the present time the writer is living in a community where the B.t.u. system is being acclaimed by some as the ideal method of purchasing coal for municipal purposes. For the last few years, in the public purchase of coal for the civic utility plants here, there have been reports of vast savings under the heat-unit system. However, to those who actually know the facts, this is far from a triumph for the new system although made to appear so, because the authorities since the initiation of the heat-unit system have exercised far greater vigilance to see that they receive proper weight.

Among coal men, this particular piece of business has for several years been a private scandal so far as the delivery of the correct weight was concerned. I happen to know as a fact that this contract was for years filled directly by the larger mining companies. Yet within the last ten years, in competition with retail coal dealers, they have actually been outbid, and the successful bidders turn around and purchase the coal from the producers whom they outbid.

Recently, competition became so strong among the retail men themselves that when the awards were made the prices were so ridiculously low that all in the trade knew that something was wrong. Nevertheless the authorities were strictly on the job this time and have become so vigilant in the matter of weights that concerns who are delivering the coal stand a good chance of losing thousands of dollars. Notwithstanding all this, there are those totally unacquainted with the facts who are proclaiming the virtues of the heat-unit system.

In conclusion let me say that I believe the only test of fuel that is of any value is the simple analysis for ash determination. In hundreds of analyses that have been submitted to me, it has invariably turned out that where the B.t.u. value was high the ash content was low and vice versa. But it does not require an expensive analysis to make this test. Any experienced fireman will usually sense it by intuition and by the evidence of his eyes when he cleans the fires. So it seems that outside of careful preparation to remove impurities and thus lower the ash, there will never be a more satisfactory test of such a variable natural product as coal than the firing test in the boiler house.

SALESMAN.

New York City.

Mine Weights Govern

Letter No. 1—In the reply to an inquiry on the controlling weight of coal shipments as affecting payment by purchaser, the opinion was expressed that it was uniform practice for weights at the mine to govern the charge for both the coal and its transportation. An old saying is, "The exception proves the rule," and this maxim will apply in the present instance, as a correspondent now writes that mine weights do not govern in the case of the fuel purchased by the Commonwealth Edison Co., of Chicago; but payment to the mine owner and to the railroad is based upon the weight of coal received at destination.

The fuel department of the Commonwealth Edison Co. purchases coal for its own use and that of its subsidiary companies. The coal consumed by these companies exceeds 5,000 tons per day, and the fuel bill amounts to more than $2,000,000 per year. This coal, which comes from Illinois and Indiana, is bought partly by contract and partly in the open market at prices ranging between 30 and 85c. per ton. The average haul is about 250 miles from the mines to Chicago, and shipments are from 48 hr. to two weeks in transit, depending on conditions.

As a safeguard against strikes and other delays in delivery, the Commonwealth Edison Co. maintains a storage in Chicago of more than 250,000 tons of coal, which is nearly a two-months' supply. All cars are weighed when received, and then weighed again when empty, and payment is made both to the mine and the railroad in accordance with these weights. The inauguration of this arrangement met opposition at first from the railroads, but it has now been in vogue for several years with satisfaction.

KAPPA.

Chicago, Ill.

Certification of Mine Foremen

Letter No. 9—Kindly permit me to comment on the letter of Robert A. Marshall, of Farr, Colo., which appeared in *Coal Age*, Oct. 21, p. 687.

After discussing at considerable length the probable effect of the clause in the new compensation law of Pennsylvania, permitting the employment of uncertified men as mine foremen, Mr. Marshall says, "A brief recital of what has been accomplished in Colorado in the reduction of the mine accident rate, by the enforced employment of certified men, during the past two years, will not be amiss."

Proceeding, then, to show how the accident rate has been and is still being reduced in Colorado, Mr. Marshall gives all the credit for this reduction to the act of certifying mine foremen in the state. While I believe in the employment of certified men for the position of mine foreman, it is safe to say that eight-tenths of the men now holding that position in Colorado held the same position previous to the time that the new law came into effect, and have been granted service certificates.

In my opinion, the fact that mine foremen in Colorado have their certificates hanging in the offices of their respective companies cannot be assumed as the sole cause of the reduction of the accident rate in the state. I ascribe the credit for this improvement, alike, to the large operators, the state mine inspectors, the compensation law, and last, but not least, the watchfulness and efficiency of the mine officials, all of which have combined to produce the good result. I may say that, unless the number of accidents is abnormally large during the remainder of this year, the fatality rate in Colorado, for 1916, will be a little over three per thousand men employed.

The situation, in a nutshell, is as follows: The general managers of the large companies have, without exception, instructed their superintendents to make every effort to reduce accidents in the mine to a minimum and, as far as one can observe, these instructions are being carried out faithfully. On the other hand it should be noted, in this connection, and I believe the chief mine inspector in this state will bear me out in the remark that he has experienced difficulty with some certified mine foremen in charge of small mines, in inducing them to carry out the requirements of the law in respect to the operation of the mine.

It is far from my wish to be understood as advocating the employment of uncertified men in any official capacity in coal mining. I believe that if the responsibility is placed squarely on the shoulders of the mine superintendents and mine foremen in the state, and they are compelled to pass a severe standard examination, there will result a great improvement in the coal industry. I fail to see any logic in making the mine foreman responsible for carrying out the requirements of the mining law and, at the same time, making him subordinate to the superintendent who is not a certified man.

Delagua, Colo. SAMUEL DEAN.

An Efficient Coal Miner

Letter No. 8—In determining the efficiency of a miner it is necessary to have some standard of comparison.

Quite recently I overheard a conversation between two miners on this subject of efficiency, and they were agreed that an efficient miner was one who could perform the greatest amount of work with the least effort, in the shortest possible time. A little consideration, however, will show that the term efficient in this case embraces a greater number of factors than those of maximum production and a minimum of effort and time. In fact, the scope of the word will depend largely on the attitude of the individual.

At the present time, especially in the bituminous mines of Pennsylvania, it is apparent even to superficial observers that the standard of efficiency chiefly used by mine inspectors and mine officials is based on the requirements of the bituminous mine law, particularly that part of the law relating to the qualifications a miner must possess before being employed, and to the manner in which he performs his work and observes the provisions of the law. Briefly speaking, these are as follows:

A miner must be over 18 years of age; be able to blast coal, rock, or slate with ordinary care; have experience in pillar work; be able to perform the work allotted him without endangering the lives of his coworkers; know the law relating to his duties, the transportation, handling and use of explosives, the quantity allowed per shift; the proper placing, charging and tamping of holes and firing of shots; and the safe-keeping of his working place and the ordering of timber.

An efficient miner must also report to the mine foreman all dangers observed, follow the instructions of mine officials and not interfere with the mine equipment. Any miner lacking the necessary experience for the proper performance of his work must be placed in charge of an experienced miner and instructed how to safely and properly perform such work.

It will be observed from this that the list of factors to be considered in determining a miner's efficiency has been greatly augmented and includes, besides maximum production with a minimum of effort and time, age limit, experience, skill in the performance of his work, knowledge of his duties, proper regard for safety to himself and others, obedience to authority, foresight in ordering supplies and respect for the property of the operator.

To the foregoing must also be added, owing to the financial interest of the operator, such other factors as are usually embodied in the special regulations prescribed by the operator or mine management and which, among other things, usually include a reasonable degree of interest on the part of the miner in the care of his working place, the loading of clean coal and the practice of economy and safety in the use of necessary supplies.

BUREAU OF MINES HIGH STANDARD

Of late years a still higher standard of efficiency for the miner has been the aim of the Bureau of Mines, through the publication of numerous Miners' Circulars. These circulars, now numbering 21, give a course of instruction that if followed by the miner will broaden his knowledge of the mine and its dangers, widen his experience, lead to increased safety and a greater degree of self-confidence and add greatly to the value of his productive effort and therefore to his efficiency.

It must not be forgotten, however, that efficiency is a relative term, depending for the degree of its perfection not only on the miner himself but on changing conditions and even upon the miner's knowledge of the experiences of others. Never at any time has the importance of these facts been brought so plainly to the attention of miners than now in the columns of *Coal Age,* where changing conditions in mines, and the methods and experiences of others in dealing with them are so fully discussed.

Collecting from the different viewpoints the various factors deemed essential to efficiency and summing them up, it will be seen that an efficient miner is: (1) One who understands and complies with the requirements of the law governing his activities in the mine and comprising the whole of his duties. (2) One who is familiar with and constantly observes the regulations prescribed by the mine management. (3) One who plans his work with foresight, keeping constantly in mind his own and others' safety. (4) One who energetically pursues the accomplishment of his work with interest in its proper performance and with the skill acquired by long practice and experience. (5) One who seeks by advice, reading and study such a proficiency in his work as will enable him to cope with emergencies as they arise and keep in touch with and profit by the experiences of others.

Hackett, Penn. ALEXANDER WAUGH.

Inquiries of General Interest

Rise and Fall of a Siphon

I have often heard the question asked as to whether a siphon can have a fall greater than the height of water column supported by the atmospheric pressure at the place. The argument has been advanced that if the fall of a siphon, by which is meant the vertical height of the crown above the point of discharge, exceeds the height of water column supported by the atmosphere, there will be a tendency for such a siphon to empty itself or run dry. I have even known men to claim that this has been proved by their experience with siphons operating under a fall in excess of the atmospheric water column.

Inasmuch as my experience is limited to siphons having a fall less than such water column, I am unable to decide this question, and would like to ask for information in regard to it, as we may soon have to install such a pipe line to drain the water from the slope bottom in our mine. The mine opening is on a hillside, which affords an excellent opportunity for a good fall in the discharge pipe. The mine is located at an elevation of 7,500 ft. above sea level, according to the figures of the United States Geological Survey. At the present time the mine is making 50 gal. of water per minute. The slope is 800 ft. long and has a total dip of 15 ft.

———, Colo. SUPERINTENDENT.

The discharge head of a siphon, or the vertical height of its crown above the point of discharge, may be either less or greater than the atmospheric water column, or height of water column that the atmospheric pressure will support. The claim that a siphon will have a tendency to empty itself when the discharge head exceeds the atmospheric water column is based on a wrong supposition. When such is the case, the diameter of the discharge pipe is not properly proportioned to its length and fall.

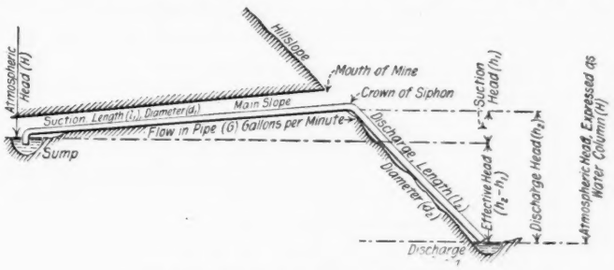
The flow of water in a siphon is, of course, limited by the amount of flow that the atmospheric pressure will produce in the suction end, which is the flow from the supply basin to the crown of the siphon. Attention has frequently been drawn in *Coal Age* to the fact that it is always necessary to first calculate the flow in the suction end of the siphon under atmospheric pressure, and then proportion the diameter of the discharge pipe to its length and fall, so as to provide for the same flow in the discharge end of the pipe line. When this is done, the flow through the entire pipe line will be continuous.

When the discharge pipe is long and has a comparatively little fall a larger diameter will be required than when this fall is great as compared with the length of the pipe. The fall or discharge head must always be greater than the rise or suction head, and their difference is the effective head, which measures the flow in the entire pipe line. However, when the pipe is properly proportioned throughout, this flow can be calculated from either the suction or the discharge end independently, or from both sections combined.

When the diameter of the pipe in inches does not exceed its length in hundreds of feet the velocity head can be ignored, and the gravity head (fall or rise) is then equal to the friction head of the flow in the pipe. Calling the diameter, length and head in the suction end d_1, l_1, h_1, and the same factors in the discharge end d_2, l_2, h_2, and the flow in gallons per minute, G, the effective head of the siphon is $h_2 - h_1$, and the general formulas for calculating the head, diameter, or flow, in any given case, are the following:

$$h = \frac{G^2 l}{800 d^5}; \quad d = \sqrt[5]{\frac{G^2 l}{800 h}}; \quad G = \sqrt{\frac{800 d^5 h}{l}}$$

The accompanying figure shows the several factors concerned in the calculation of a siphon, for any given



ELEVATION OF MINE SIPHON

flow G, in gallons per minute, at any elevation above sea level having an atmospheric pressure H, expressed in feet of water column.

Now, substituting the values given in the inquiry, remembering that the atmospheric water column corresponding to an elevation of 7,500 ft. above sea level is, say 25.68 ft., and making the effective head in the suction pipe $H - h_1 = 25.68 - 15 = 10.68$, and likewise the effective head in the discharge pipe, assuming a fall of, say 60 ft., $h_2 - H = 60 - 25.68 = 34.32$ ft., and a length $l_2 =$ say 300 ft., we have as follows:

Diameter of suction pipe,

$$d_1 = \sqrt[5]{\frac{G^2 l_1}{800(H - h_1)}} = \sqrt[5]{\frac{50^2 \times 800}{800 \times 10.68}} = \textit{say 3 in.}$$

Diameter of discharge pipe,

$$d_2 = \sqrt[5]{\frac{50^2 l_2}{800(h_2 - H)}} = \sqrt[5]{\frac{50^2 \times 300}{800 \times 34.32}} = \textit{say 2 in.}$$

When the pipe line is proportioned, in this manner, to the effective head producing the flow in each branch of the pipe, the respective lengths of the suction and the discharge, and the quantity of water to be handled, the result may be checked by calculating the flow for the entire length of pipe by the formula,

$$G = \sqrt{\frac{800(d_1 d_2)^5 (h_2 - h_1)}{d_1^5 l_2 + d_2^5 l_1}} = \sqrt{\frac{800(2 \times 3)^5 (60 - 15)}{3^5 \times 300 + 2^5 \times 800}}$$

$$= 53 \textit{ gal. per min.}$$

This result is slightly greater than the required discharge (50 gal. per min.) owing to taking the pipe diameters, 2 in. and 3 in., instead of the exact values.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—A volume of 10,000 cu.ft. of air is passing in an 8x10-ft. airway under a pressure of 13 lb. per sq.ft. Find the length of the airway.

Ans.—Write the formula for unit of ventilating pressure, which is

$$p = \frac{klov^2}{a}$$

The sectional area of this airway is $a = 8 \times 10 = 80$ sq.ft. and the perimeter, $2(8 + 10) = 36$ ft. The velocity of the air current is $10{,}000 \div 80 = 125$ ft. per min. Taking the value of the coefficient of friction as $k = 0.00000002$ and substituting these values in the above formula, we have

$$13 = \frac{0.00000002 \times l \times 36 \times 125^2}{80} = 0.000140625l$$

The required length of the airway is therefore

$$l = \frac{13}{0.000140625} = 92{,}450 \text{ ft.}$$

Ques.—A current of 3,000 cu.ft. of air and gas is at the highest explosive point; how much air should be added to so dilute the mixture as to show only a faint cap in the safety lamp?

Ans.—The answer to this question will depend upon the kind of lamp used. When using the unbonneted fireboss Davy, the first indication of the flame cap will generally be observed when there is 2 per cent. of gas in the current. A mixture of pure marsh gas and air at its most explosive point contains 9.46 per cent. of gas. The volume of gas in 3,000 cu.ft. of this mixture is therefore $3{,}000 \times 0.0946 = 283.8$ cu.ft. This volume will be 2 per cent. of a current containing $283.8 \div 0.02 = 14{,}190$ cu.ft. The volume of air that must be added to the mixture to produce this condition is therefore $14{,}190 - 3{,}000 = 11{,}190$ cu.ft.

Ques.—How would you remove and prevent the accumulation of explosive gas on falls in pillar workings?

Ans.—Before attempting to remove a body of gas accumulated on the falls, notify and withdraw all the men working on the return air proceeding from this place, and guard all entrances to the return airway by placing trustworthy men at such places to prevent anyone entering. Then, starting at the intake end, deflect the air current so that it will pass over the falls. In order to do this, it will be necessary to erect a special brattice of canvas. Time must be given for the air to sweep away the accumulated gases. Only safety lamps must be used, and a careful watch must be kept to ascertain the progress of the work. None but experienced firebosses should attempt the removal of gas.

To prevent the further accumulation of gas on falls, the air current must be made to sweep the top of the falls where the gas has a tendency to collect.

Ques.—What defects would you look for in a safety lamp before giving it to a workman?

Ans.—The lamp should be carefully examined in every part and cleaned before being put together. Provided this has been done previously, before it is handed to the workman, the lamp should be examined to see that it is filled with oil and properly put together. Special attention should be given to observe that the gauzes are in place in the lamp and the bonnet properly arranged. It is important to examine the gauze carefuly to see that the wires are not broken or the gauze damaged in any respect and that it is clean and free from dust and oil. The examination of a lamp can only be done properly when it is being put together. When handed to the workman the flame should be adjusted so that the lamp will not smoke.

Ques.—How would you render first aid to a victim suffering from electric shock; to one suffering from powder burns; to one suffering from broken limbs?

Ans.—Assuming that the victim has been removed, or is not in contact with a live wire, or other conductor, artificial respiration should be applied. The victim should be laid on the ground with his face down, but his head turned slightly to one side to permit the free access of air to the mouth and nostrils. The operator kneeling astride of the body, but not allowing his weight to rest upon it, should place the palms of his hands over the short ribs on the small of the back, with the thumbs nearly touching each other. Then, by a forward and backward movement of his body, the operator should continue to alternately exert and relieve a pressure on the body of the patient, at the rate of 14 or 15 a minute, after the manner of natural breathing. This should be continued until the patient shows signs of recovery. It may be necessary to continue this treatment for one or two hours before the attempt at resuscitation abandoned. Spirits of ammonia applied on a handkerchief placed near the nostrils will greatly assist the effort to revive a person. At the same time the patient should be put to bed and allowed to sleep.

When the burn is severe send at once for a doctor and, in any case, apply a thin paste of baking soda and water, vaselin, olive or castor oil, lard or cream. An emulsion of boiled linseed oil in lime water is always good.

Apply splints and bind the broken limb carefully to prevent laceration of flesh while waiting for a doctor.

Ques.—What knowledge should a fireboss possess relative to mine gases and safety lamps?

Ans.—A fireboss should be thoroughly acquainted with the properties and behavior of all the mine gases and understand their effects on both life and flame. He should understand the most approved methods dealing with gases to remove them from the mine and prevent their accumulation. He should know how they occur or are produced in the various operations of the mine.

A fireboss should be fully acquainted with the principles, construction and use of a safety lamp. He should be able to take the lamp apart, clean and fill it, and reassemble it ready for use again. Every fireboss should take full care of his own lamp.

Coal and Coke News

Washington, D. C.

Increases in the cost of coal have been fer in the Panama Canal Zone, according to a notice issued by the Panama Canal office in this city. A formal notice that the price of coal will be advanced to steamships using the canal has been served by this office, to become effective Dec. 1 next. The notice follows:

"In view of the early expiration of the present contract for coal and the higher price which must be paid under new purchase arrangements, effective Dec. 1, 1916 (on which date it is assumed that all coal purchased at the old price will have been disposed of), and until further notice, the following prices will obtain at the Panama Canal for coal supplied to steamships, including warships of all nations: Christobal-Colon—Delivered alongside of vessels in lighters or in cars on the wharves, and trimmed in bunkers (per ton of 2,240 lb.), $8; Balboa—Delivered alongside of vessels in lighters or in cars on the wharves, and trimmed in bunkers (per ton of 2,240 lb.), $9.50.

The prices announced in notice dated July 29, 1916, of $7.50 and $9 per ton at Cristobal-Colon and Balboa respectively will be in effect from Oct. 1 to Dec. 1, 1916, but the Panama R.R. has been authorized to discontinue the additional charge of $2 per hour for the use of each mechanical hoist or crane furnished, effective Sept. 15, 1916, and the paragraph fixing this charge in the notice of July 29, 1916, is cancelled."

A hearing involving New Mexico coal and coke rates has been scheduled by the Interstate Commerce Commission for Dec. 16 next. It will be held at Amarillo, Tex., before Examiner Brown. This case is scheduled upon the investigation and suspension docket as No. 892 and relates to the proposed increases in the rates on coal and coke from New Mexico points to interstate destinations.

Coal-Market Data To Be Compiled

To meet a demand for more data on which an intelligent study of coal markets can be based, the United States Geological Survey has added a new section to its reports on coal for 1915. This report will deal with the distribution and consumption of coal. In discussing his forthcoming report, C. E. Lesher, the statistician of the Geological Survey, says:

"For 34 years the Geological Survey has collected and published the statistics of the production and value of coal, but this is the first comprehensive investigation made to show in detail where the coal produced is consumed. The competition between the bituminous coal-producing districts of the United States for the domestic markets is as active as that between the coal-exporting nations of the world for the foreign markets.

Since 95 per cent. of the coal produced in the United States is used within the country, knowledge with regard to the extent and nature of the demand in the domestic markets is greatly desired. In fact, it is the largest problem confronting the exploiters of a coal deposit."

In an effort to relieve the car shortage situation, representatives of the Geological Survey and of the Bureau of Mines, whose duties bring them in contact with coal operators and railroad traffic officials, are calling attention to the measures of relief which would be obtained in case the loading of cars could be increased two tons. It is believed by Government specialists that in most cases two tons could be added to the loading of a car without violating the regulation forbidding loading to more than 10 per cent. above the marked capacity of the car. On a system like the Pennsylvania, if this increased loading could be applied to all its cars, a total of 44,000 cars would be released for additional service.

The Movement of Coal

Seventy-one per cent. of all anthracite coal produced in the United States moves in interestate commerce, according to information which has been compiled by the Geological Survey. The interstate movement of bituminous coal is 47 per cent. of the total production. Eighty-six per cent. of the anthracite and bituminous coal moves to market by rail or water. A considerable portion of the remaining 14 per cent. reaches its market by rail or water after it has been made into coke.

With the exception of West Virginia, the large coal-producing states use considerable amounts of the product within their borders. In West Virginia, however, only 8 per cent. of the coal mined in that state is used there. This compares with 38 per cent. in Pennsylvania, 45 per cent. in Illinois and 43 per cent. in Ohio. Ninety-six per cent. of all coal produced in the United States was used within the country in 1915, according to C. E. Lesher, of the Geological Survey.

While the exact figures are not available to the public at this time, some other interesting features with regard to the coal movement in 1915, which may be deduced from the figures which now are being compiled by the Geological Survey, follow:

Ten states contributed to the supply of coal shipped to Tidewater, but 92 per cent. of the aggregate came from Pennsylvania and West Virginia. Nine per cent. of the Pennsylvania production moved to Tidewater.

Of the coal handled on the Great Lakes about 25 per cent. was exported to Canada.

Nearly 60,000,000 tons of bituminous coal mined in Pennsylvania was consumed within the state. New York bought 15,000,000 tons of bituminous coal in Pennsylvania, Ohio took 7,000,000 tons, New Jersey 3,000,000 and New England 6,000,000. Pennsylvania bituminous coal was shipped into 37 states. Railroads used over 30,000,000 tons of Pennsylvania coal.

Coal was shipped from Illinois to 17 other states. Most of this movement was to the north and west of the point of production. Little Illinois coal moved east of Chicago. More than 40 per cent. of coal mined in Illinois was consumed within the state. Chicago consumed 10,000,000 tons of coal from Illinois mines. The Peoria and East St. Louis districts consumed about 12,000,000 tons. More than 30 per cent. of the Illinois production was used by railroads.

More than 10 per cent of the West Virginia production was loaded into bottoms plying the Great Lakes. About 30 per cent. of the state's production moved to Tidewater. Something over 15 per cent. of the West Virginia production was used by the railroads.

Ohio uses 40 per cent. of its own coal. Only about 10 per cent. is shipped to other states. Over 30 per cent. is used by the railroads. Lake shipments amount to about 10 per cent.

No Conspiracy Is Believed to Exist

Government coal specialists incline to the opinion that no conspiracy or other unlawful action will be found to exist among coal operators or coal-carrying railroads in the investigation which is being made by the Department of Justice. Since the initiative in this matter was taken by a Government department the specialists at the Bureau of Mines, the Geological Survey and the Interstate Commerce Commission are disinclined to comment. In conversation with some of them, however, it is not difficult to divine that they attribute coal prices and coal shortages to causes which cannot be classed as unlawful.

With the knowledge that space in the daily press is not at as high a premium on Monday morning as on other days, Washington correspondents were notified by telephone Sunday afternoon by employees of the Department of Justice that a statement was ready for distribution. The statement as issued to the correspondents follows in its entirety:

"The Attorney General has authorized the following statement:

'The Department of Justice is investigating the recent abnormal and suspicious increases in the prices of various necessaries of life, especially coal. Wherever any such increase is found to have been due to conspiracy or other unlawful action, the Department will invoke against the offenders the severest penalties which the law prescribes.'"

The investigation is in charge of George C. Todd, assistant to the Attorney General. No comment in addition to the statement was forthcoming from Mr. Todd's office other than the fact that the investigation of food conditions is centered at Chicago and Boston. Inquiry of Mr. Todd brought forth the information that the coal investigation was very general and could not be said to center at one point.

The fact that emphasis was placed on the coal situation has created a general belief here that the Department has discovered evidence of a conspiracy. While the Department of Justice has not confirmed this, its silence is interpreted as an intimation that such evidence has been found. Those in especially close touch with the coal mining industry, however, refuse to believe a conspiracy exists.

To Investigate the Death of Bureau Worker

An investigation of the cause of the recent death of Lewis M. Jones, of the Bureau of Mines, in the mine of the Jamison Coal and Coke Co., at Barrackville, W. Va., has been undertaken by the Bureau of Mines. J. W. Paul, of Pittsburgh, has been engaged to look into the matter. The apparatus which was being used by Mr. Jones at the time he was overcome was sealed shortly after his removal from the mine and will be examined by Mr. Paul and other experts in an effort to establish if the breathing apparatus was responsible for his death. There is reason to think that the physical condition of Mr. Jones may have been responsible for his death. It is the intention of the Bureau to go to the bottom of the matter.

PENNSYLVANIA

Anthracite

Hazleton—The Lehigh Valley Coal Co. has notified its employees that its free nursing service will be made available after Jan. 1 to the families of its men, as well as those injured in and about the mines.

Nesquehoning—The expected influx of labor to the anthracite region with the coming of fall has so far not materialized. Usually at this time of the year many laborers come into the region after having worked on farms all summer. This spring in addition to these men, large numbers left to work in manufacturing plants. These have not come back, nor is it expected that they will return during the present season.

Jeddo—Employees of the G. B. Markle Co. were called out recently to fight a serious brush fire raging near Highland No. 6 colliery, which was menaced for a time by the flames. Brush fires are reported all over the Hazleton region.

Throop—After a month of idleness caused by extensive squeezes in its underground workings, the Pancoast colliery that employs about 1,000 men and boys has resumed work. Most of the damage caused by the squeezes has been repaired, but it will be at least three weeks before some of the most badly damaged roads in the mines are cleared up. During the past few months a number of streets in the borough have been damaged by the Pancoast squeeze, and water pipes have been snapped in many places. A few houses were also damaged, but none of them seriously.

Wilkes-Barre—The statement of shipments of anthracite, as compiled by the Bureau of Anthracite Statistics, shows that from Apr. 1 to Sept. 30, the production in 1916 was 2,075,000 tons less than during the corresponding period of the previous year. This decrease has been due almost entirely to a shortage in labor, and there has been no time when there was a surplus of coal on the market. The storage yards have been entirely depleted of their supply.

The Lehigh Valley Coal Co. has issued orders to all foremen to bring up the tonnage of anthracite during the current month to meet the increased demand for fuel.

Scranton—It is estimated that 20,000 mine workers, mostly young men, have quit the hard coal fields and obtained employment from manufacturing concerns throughout the country. This has resulted in a shortage of labor at the mines. Because of this and the present demand for coal there is a shortage at tidewater and large centers in the East.

Bituminous

Pittsburgh—The bituminous coal operators of central Pennsylvania recently took out a charter for the Pennsylvania Bituminous Mutual Association to insure employees liability. This company has offices at Huntingdon, Penn. C. H. Miller is president, and C. M. Hansen, treasurer. Over 20 firms are members.

Connellsville—The Connellsville region recently produced 430,331 tons of coke per week. Of this, merchant ovens produced 171,357 tons, and furnace ovens 258,947 tons. Shipments for that week aggregated 417,862 tons. Compared with the previous week the increases to the various destinations to which the coke was shipped were as follows: Pittsburgh, 8,946 tons; west of Pittsburgh, 10,114 tons; east of Connellsville, 1,202 tons.

California—In order to insure an adequate supply of coal for future needs at its mills in the Pittsburgh district, the Jones & Laughlin Steel Co. recently closed large contracts with independent coal companies along the Monongahela Valley. The Vesta mines and others owned by the Steel company are producing enough coal to supply its present needs, but transportation facilities are inadequate to enable the firm to store enough fuel for winter use during the remainder of the river season.

Uniontown—A night mining school will be opened shortly in the Dunbar Township High School at Leisenring. R. K. Smith, supervising principal of the Dunbar township schools, will have supervision over this one, and James Wardlaw, of Scottdale, will be the instructor. Sessions will be held on Tuesdays and Fridays of each week. Special attention will be given to those subjects designed to prepare the candidate for mine foremen's and firebosss' examinations.

A deal has just been closed whereby the Bessemer Coke Co., of Pittsburgh, has conveyed to the Champion Gas Coal Co. all of the Pittsburgh coal bed underlying 305 acres of land in East Bethlehem Township, and the surface of 105 acres. The consideration is understood to be in the neighborhood of $275,000.

Johnstown — An organization was recently effected and plans made to establish a mine rescue and training station in this district. It is probable that this station will be established in Johnstown. First-aid teams will be organized at all the coal plants and the men will receive their training at the station. Charles Owen was elected president of the organization, and C. C. Dovey was made secretary. Another meeting will be held soon.

Portage—The Ivy Ridge Coal Co. has sold its operation at Portage to the Portage Smokeless Coal Co. which will take possession shortly. Six hundred acres of coal are included in the transfer. Electric haulage will be installed and other improvements made.

WEST VIRGINIA

Moundsville—The Ben Franklin Coal Co. has a force of men at work making improvements at the Panama mine. This mine will supply the smelter plant with coal when it is in operation, and the improvements are being made in order to deliver the coal on the site of the plant.

Princeton—November has started with the Virginian Railroad Co., following October as a record month in the road's history in the shipment of coal. It is said that the Virginian has plenty of cars, and the outcome is that this month's tonnage will surpass that of October by a large margin.

Omar—The Main Island Creek Coal Co. has begun grading a 3-mi. extension of railroad to seven new mines which are to be opened. At some of these entries are being driven. When this work is completed, this company will be operating 11 mines on the Island Creek seam of coal.

Grafton—James Clark, of Cumberland, Md., has purchased the properties of the McGraw Coal Co. The price paid is said to have been $385,000.

Williamson—The car movement west is far below the rated capacity of the mines. This is said to be due to the withdrawal by the Pennsylvania R.R. of its cars for service between Gary, W. Va., and Gary, Ind., for the U. S. Steel Corporation.

ALABAMA

Ensley—The Semet-Solvay Co. has purchased approximately 7,300 acres of coal land in Tuscaloosa County from the Alabama Co. The price paid is said to have been approximately $500,000. These coal lands are in the vicinity of the Semet-Solvay plant at Ensley. This is one of the company's largest coke-oven plants, 240 ovens being in operation. Heretofore, the Ensley plant has been supplied with coal from mines other than those owned by the company, and this is said to be the first purchase of coal lands of this company in the South.

KENTUCKY

Hazard—The Columbus Coal Mining Co. has let contracts for the building of 100 miners' houses and three welfare buildings in "The Bend" immediately below this city, where it is making active preparations for one of the largest coal developments in the Hazard field. The Louisville & Nashville is rushing construction of a short line branch railroad to reach the new development.

McRoberts—The Consolidation Coal Co is completing 50 new miners' houses in the Shea's Fork section of the town with the expectations of increasing the working force at Nos. 213 and 214 mines within 30 days in the event there is an improvement in the car-shortage situation.

Jenkins—The extensive mines of the Consolidation Coal Co. are averaging about two days per week idle due to the car shortage which confronts the mining industry all over the country. The same is true of the company's mines at McRoberts in the Kentucky River territory and at Van Lear in Johnson County.

Frankfort—Eastern Kentucky land owners are interested in the escheat proceedings which have been undertaken against three banks and T. C. Millard, of Danbury, Conn., by which the state seeks to escheat 42,400 acres of land in Perry and Knott counties. The proceedings are brought under the statute which prohibits foreign corporations owning property in Kentucky for five years except when it is used in connection with their business.

Whitesburg—Coal operators of the Elkhorn and Boone's Fork section have started investigations of the shortage of coal cars, which, to a marked degree, has hampered shipments. A thorough investigation will follow.

OHIO

Lisbon—Experienced coal men recently took leases on several farms west of Lisbon, with a view to developing coal in that vicinity. It is said that work will be started soon in this field.

Columbus—In compliance with an order of the Ohio Public Utilities Commission, all coal-carrying roads operating in Ohio are reporting the status of the coal-car supply, showing the number of cars in transit on their lines, at stations on their lines or loaded, on Oct. 30. The reports are expected to show 15,000 loaded coal cars in transit as of that date.

Dover—Many Tuscarawas County farmers are adding a profitable side line by opening coal mines on their farms to supply local demand. Scarcity of cars has caused a coal famine and the price has been increased by dealers from $2.50 to $3.50 a ton. Most land here is underlaid with from 3 to 4 ft. of coal, and the demand is such these "country mines" run to capacity.

Athens—Reports from many mines in the Hocking and Sunday Creek districts indicate that the car shortage has in some cases reduced operations to 20 per cent. of capacity, and others to one-third.

ILLINOIS

Montgomery—It is reported here that a big coal mine is to be sunk in this county by a company composed of grain dealers of St. Louis. William Lanyon is expected to be at the head of the company. He recently purchased 200 acres of land near here, on which it is expected that the shaft will be sunk.

O'Fallon—Samuel Baxter and E. H. Smiley, receivers of the Joseph Taylor Coal Co., have petitioned Judge Crow, of the St. Clair County Circuit Court, for leave to sell the St. Ellen mine here to John Henderson and Louis Fischer, of St. Louis, for $31,000. The St. Ellen is the last of three mines formerly owned by the Taylor company. The Taylor mine and a part of the Ridge Prairie mine have already been sold by the receivers for $30,000. Real estate held by the company has been sold for $20,000 and personal property has brought a total of $1,500, making a grand total of $51,500. As the indebtedness of the company is more than $100,000, there will not be enough even after the sale of the St. Ellen to settle.

Carlinville—The 139 miners in the Carlinville shaft were called out a few mornings ago when a buring barn threatened to set fire to the air shaft.

Coffeen—A force of men is cleaning up and making repairs in the Cloverleaf mine here, which will be opened in a short time. The mine, which is controlled by the Biggens Coal Co., of Chicago, was closed several months ago and it was announced that it would not be reopened. It is now said that the former force of 200 men will be increased to 300.

Belleville—With all of the mines in this district working, a serious shortage of miners and top laborers is prevailing. At some mines it is impossible to get enough men to take care of the shift work and several operations are severely handicapped on account of no miners and no laborers.

Operators of the Belleville district expect to run all winter whenever they can get cars. Every mine in the district is now running. It is said that the output of nearly all of the mines is contracted for to Apr. 1.

Collinsville—Mine No. 3 of the Lumaghi Coal Co., which has been shut down for two years, has again resumed operations and it is expected that within the next week developments will permit of a big tonnage daily.

Marion—The Peabody Coal Co., which bought the mine and washer of the defunct Illinois Washed Coal Co. and the Carterville District Coal Co. north of here, is dismantling the property and is going to work the remaining coal rights from mine No. 3 of the Peabody Coal Co.

In spite of the severe car shortage of the present time, some mines in Williamson County showed nearly a record tonnage for the week of Oct. 23 to 28. The Chicago & Carterville Coal Co. produced 15,340 tons. The Johnston City Coal Co. was second and the Peabody Coal Co. third with 12,586. The best tonnage for the month probably went to the Chicago & Carterville Coal Co. with about 72,000 tons. In view of the greatest car shortage ever known here this tonnage is exceptionally good.

Du Quion—W. A. Lafont, of the Washington Coal Co., of St. Louis, who was formerly secretary of the Rutledge & Taylor Coal Co., has secured options on several thousand acres of coal rights near here and test drilling is now going on. The sinking of one or two shafts is contemplated in the spring.

IOWA

Shenandoah—A 5-ft. bed of coal was recently discovered a few miles west of this town. While boring for water, a farm owner discovered a 5-ft. bed of coal about 250 ft. below the surface. It is believed that if this coal bed is workable, it will be developed.

OREGON

Marshfield—Three miners were killed and two injured in a gas explosion recently at the Beaver Hill coal mine, near this place. Black damp seriously impeded rescue work.

Personals

W. D. Barrington, a chemist for the Consolidation Coal Co., has been appointed assistant engineer of tests for this firm with offices at Fairmont, W. Va.

Governor R. L. Williams of Oklahoma has appointed the following delegates to the American Mining Congress, which will meet in Chicago, Nov. 13-16; Ed Boyle, Oklahoma City; A. Nichols, Haileyville; Frank Hailey, Henryetta; George W. Fry, Claremore; J. E. Stivers, Wilburton; J. J. Sullivan, Dewar; Ed Hogan, McCurtain; D. C. McAlpin, Lehigh; Boyd Martin, Bache.

Charles J. Norwood, state mine inspector of Lexington, Ky., has just made an inspection of the coal operations of the Consolidation Coal Co. in the Jenkins-Dunham-McRoberts fields and the Elk Horn Mining Corporation in the Fleming-Haymond-Hemphill sections. Inspector Norwood expressed himself as well pleased with the showing of the big coal corporations during the past few months.

Edward B. Winning, of Pittsburgh, Penn., master mechanic and chief electrician for the United Coal Corp., and subsidiary companies, has resigned his position, effective Nov. 15, to accept a similar one with the coal and coke department of the Republic Iron and Steel Co. He will in future be located at Republic, Penn. Mr. Winning will be succeeded by W. J. Baillie, of Charleroi, Penn., now occupying a similar position with the Youghiogheny & Ohio Coal Co. at that place.

Industrial News

St. Paul, Minn.—The Lehigh Coal Co. will erect a $10,000 coal elevator next spring at the new receiving yard in St. Paul, at Midway, on the Minnesota Transfer Railway Co.'s tracks.

Lowesville, W. Va.—A contract for building ten new houses was recently let by the Monongahela Coal Co. The work is to begin as soon as material can be placed on the ground.

Clearfield, Penn.—The Indiana-Moshannon Coal Mining Co. has been incorporated with a capital stock of $5,000. The incorporators are A. H. Woodward, William A. Haggerty and Ambrose Flanigan, all of Clearfield.

Cleveland, Ohio—The Maple-Nixon Coal Co. has been incorporated with a capital of $50,000, to mine and sell coal. The incorporators are Mark A. Copeland, C. A. Alexander, George A. Mowery, C. Verbsky and O. E. Schulz.

Eagen, Tenn.—The Campbell Coal Mining Co. recently made enlargements to its power plant, located in Eagen. The additions included one 250-hp. Erie City boiler, and the installation of a similar unit is in preparation.

Lansford, Penn.—So strong is the demand for cars in the anthracite region that the Lehigh Valley Coal Co. is repairing and putting into service wooden equipment made 20 years ago and which it had been decided to abandon.

Wheeling, W. Va.—The Richland Coal Co. expects to start loading coal at its new mine located on Buffalo Creek, on or about Nov. 15. With this new operation running full it expects to have a capacity of 125,000 tons per month.

Williamsport, Penn.—The Williamsport Wire Rope Works is now constructing a new wire mill. The building will be 155x333 ft., and will be in operation about the first of the year with a capacity of 25 tons of wire per day.

Jersey City, N. J.—An investigation of the coal-transportation situation designed to develop whether shipments are being held up in New Jersey for purposes of speculation has been ordered by the Public Utilities Commission.

St. Louis, Mo.—The first barge of the Kansas City-Missouri River Navigation Co. to make a round trip to New Orleans has completed the round trip as far as St. Louis. From now on the company's barges will make regular trips.

Johnstown, Penn.—The Estep Bros. Coal Mining Co. recently sold its holdings at Moss Creek to the Pennsylvania Coal and Coke Corp. Several hundred acres of coal, two mines, railroad sidings, and modern equipment, are included in this sale.

Pittsburgh, Penn.—For the first seven months of this year 12 railroads leading from the Pennsylvania-West Virginia bituminous regions moved for company fuel 15,825,000 tons of coal, an amount 17.1 per cent. greater than for the same period of 1915.

St. Louis, Mo.—For the first time in 20 years, Illinois coal is being shipped eastward. Ohio, Indiana and Michigan are taking all the Illinois coal they can get and clamoring for more. Requests for coal are also coming from as far west as Omaha, Neb.

Uniontown, Penn.—The H. C. Frick Coke Co., of Pittsburgh, is equipping a number of its mines in the Connellsville coke region with purchased power, secured from the West Penn Power Co. This is replacing electric energy of the company's own manufacture.

Hellier, Ky.—The Kentucky Solvay Co., recently organized at Ashland, Ky., with a capital of $500,000, has increased its capital stock to $1,000,000. This company has purchased the plant of the Elkhorn Consolidated Coal and Coke Co. and property rights surrounding Hellier.

Assumption, Ill.—The Illinois Central Railroad Co. is erecting a coal chute here which is to cost about $20,000. The foundation of concrete is to be 26 ft. below the surface. The structure will be 40x

48 ft. and will have a storage capacity of 300 tons. It will be modern in every way.

Cincinnati, Ohio—The final report of Receiver Aaron A. Ferris, of the Dominion Coal Co., has been filed in the United States District Court, showing a balance available for fees, expenses and dividends amounting to $2,386.08. The claims of general creditors of the company total $5,842.68.

Baltimore, Md.—Ground has been broken at Sparrow's Point for the erection of 240 additional coke ovens to be built for the Bethlehem Steel Co., by the H. Koppers Co., of Pittsburgh. The material for the new ovens is now being assembled at the plant, and the work of building will be started soon.

New York, N. Y.—The Giles Drilling Co., Inc., has taken over the business, plant and equipment of the firm of Giles & Clark, engineers and contractors. The latter firm has been dissolved by the retirement of Edward A. Clark from the business. The offices of the new firm are at 30 Church St., New York.

Johnstown, Penn.—Howard Kerr, of Cairnbrook, recently brought suit against the Loyalhanna Coal and Coke Co. for $30,000 damages. He alleges that he was sent to the top of a tower to make repairs and that while he was engaged in so doing the tower fell, causing a partial paralysis that affects his sight and hearing.

Carrolltown, Penn.—Charles Milson and others are interested in a new mining project in northern Cambria County. A mine is to be opened on the old Fisher tract. It is said that the first mine will be followed immediately by another, and that the men plan to operate on an extensive scale. A modern tipple will be erected.

Fairmont, W. Va.—The holdings of the Dakota Coal Co. were recently sold to George E. Amos for $239,000. These holdings consist of 270 acres of Pittsburgh coal and 80 acres of Sewickley coal, a number of mining buildings and other equipment, and the plant. This latter is located within two miles of the city upon the river.

Huntington, W. Va.—During the month of October over 2,400,000 tons of coal were carried by the Chesapeake & Ohio Railroad Co., the exact figures being 2,407,705 tons. This does not include the reports from some small shippers which may add 10,000 to 15,000 tons more. The total figures closely approximate the high record of the road.

Bluefield, W. Va.—A tract of 21,000 acres of land, rich in coal and timber, located in the vicinity of Dumps Creek, one of the best coal fields in Buckhannon and Russell Counties in southwest Virginia, was recently sold to parties said to represent Eastern capitalists; 9,000 acres were sold at $9 per acre, and 12,000 for $10 per acre.

Montgomery, W. Va.—Coal operators in the vicinity of Montgomery state that they are unable to work their mines more than two days per week because of the car shortage. While they have daily offers of high prices for their product they are unable to even fill orders now under contract. The same difficulty confronts the operators in other fields.

Whitesburg, Ky.—The Whitesburg Telephone Co. announces the building of local and long-distance telephone lines from this city via Benham and other flourishing coal-mining towns to Harlan, the county seat in the center of a rapidly developing coal field. This will make a most important connection and accommodate a score or more of mining companies.

Altoona, Penn.—Because of the scarcity and exorbitant price for bituminous coal in this city, the Pennsylvania R.R. has issued notices that it will sell to its local employees the coal stored when the miners' strike was threatened. The price asked will be $1 per load, thus making the price about $1.50 per ton delivered, as against $4 asked by the dealers.

Williamsport, Penn.—The Cogan House Coal Co. has just been incorporated to develop a tract of land in Lycoming County, 13 mi. north of here, upon which has been located a 6-ft. bed of semi-anthracite. Several openings have already been made and it is planned to market the coal in this city by building an electric line, as the property is located 8 mi. from any railroad.

Hemphill, Ky.—(P. O. Baker, Ky.)—J. K. Parsons and J. W. Montgomery, of Logan, W. Va., have purchased the interest of Perry F. Gorman and J. W. Reedy in the Elk Horn By-Product Coal Co. and will make extensions in the plant, beginning at once. These men are also interested in other developments in the Elkhorn coal field, and will make a number of new extensions.

Stanford, Ky.—The Boreing Land and Mining Co., successors to the Cumberland Valley Land Co., has elected officers as follows: President, J. S. Hocker; vice-president, George McRoberts, and secretary-treasurer, J. W. Hayden. The company, which holds 3,500 acres of Harlan County land, will engage an engineer to make an examination of the coal deposits of the company.

Bellingham, Wash.—The Pacific Anthracite Development Co. has been incorporated with a capital of $100,000 for the purpose of opening a coal claim near Deming where the company owns a property showing anthracite and high-grade bituminous coal in large quantities. Charles H. Clendennin and John Siegfried, of Bellingham, and R. M. Bruce, of Seattle, are the incorporators.

Stearns, Ky.—The Fidelity Coal Mining Co., with $30,000 of capital stock, has been incorporated at Exodus, Ky., and has 1,000 acres under lease. The company plans to develop for a daily output of 1,000 tons but will not open machinery bids until Jan. 1. J. E. Butler is president and manager and H. C. Trent, secretary. K. W. Dyas, of the Stearns Coal and Lumber Co., will handle the output.

Laredo, Tex.—The report of the customs officials for the Laredo district, which includes the ports of entry of Brownsville and Laredo, shows that during September a total of 3,371 tons of coal, valued at $12,196, was exported from the United States into Mexico. This coal was used for the most part in the operation of the mines and was exported by Americans to American companies in Mexico.

Wheeling, W. Va.—A force of men was recently put to work, making an entry for a prospective coal mine into the property of the Wheeling Limestone Co., at Rock Point. It is claimed that a considerable amount of coal is beneath this property, and it is the intention of the company to mine it. Three shifts are being worked, and every effort is being made to reach the coal as quickly as possible.

Columbus, Ohio—The announcement is made by J. W. Blower and D. C. Thomas of the Hisylvania Coal Co., who own an 800-acre tract near Blair, W. Va., on the Chesapeake and Ohio that a 7½-ft. vein of No. 5 splint coal has been discovered on the tract. The two gentlemen will start development by opening the vein as well as opening another vein of gas coal on the property. There is one working mine in the gas coal vein.

Huntington, W. Va.—The Buck Branch Coal Co., of Huntington, W. Va., was recently organized to operate in coal and coke. The capital stock is $50,000, and the incorporators are: R. A. Morris, Kenova, W. Va.; D. E. Hewitt, J. L. Caldwell, Jr., W. E. Deegans, K. P. Morris, all of Huntington, W Va. This company will construct and equip an up-to-date plant for mining the No. 2 gas bed near Kermit, W. Va., on the N. & W. Ry.

Chicago, Ill.—The American Steam Conveyor Corp. has been organized and has taken over the business of the Girtanner-Daviess Engineering and Contracting Co., St. Louis, Mo., and the Griffin Engineering and Construction Co., Elkhart, Ind. Under the new arrangement factories will be maintained in St. Louis, Mo., New Albany, Ind., and in New Jersey. The offices of the new firm are located at 30 N. La Salle St., Chicago.

Bluefield, W. Va.—W. J. Pritchard and associates, at Bramwell, recently closed a deal whereby they become the owners of the Burnwell Coal and Coke Co., operating in the Elkhorn-Kentucky seam of byproduct steam and gas coal. The Burnwell plant now has a production of 20,000 tons per month, while the development and equipment justifies an output of 40,000 tons. It is the intention of the new owners to see that this output is reached in the near future.

Covington, Ky.—Five thousand acres of Breathitt and Knott County land will be sold at the courthouse door in Jackson, Ky., on Dec. 6, and at the same time 4,979 shares of common stock of the Breathitt Coal, Iron and Lumber Co. will be offered. The sale is the outcome of the suit of the United States Mortgage and Trust Co. against the Kentucky Land & Timber Co. United States Circuit Clerk John Menzies, of Covington, is commissioner in the case and will conduct the sale.

St. Louis, Mo.—At a special meeting of the St. Louis Coal Club vigorous steps were decided upon to force the passage of a new bill through the House of Delegates which will do away with the city scale ticket made out with each load of coal and which costs the dealer 3c. each. These net the city $24,000 a year and neither the public nor the dealer gets any protection or benefit of any kind. The only expense the city is put to is the printing of these tickets, which cost 28c. per M.

Boston, Mass.—The management of the New York, New Haven & Hartford R.R. has decided to follow out the recommendation of the American Railway Association and file a tariff which will substantially raise the general demurrage charges for detention of freight cars on this road. Against the present charge of $1 per car per day after 48 hours' free time, the new charge is to be $2 for the first day after the free time, $3 for the next, $4 for the next and $5 per day thereafter.

Columbus, Ohio—Secretary B. F. Nigh, of the Michigan-Ohio-Indiana Coal Association will make a strenuous effort to prevent the new rate of demurrage charges as announced by a number of Eastern roads from becoming effective. He is of the opinion that the new schedule, providing for $2 for the first day after the 48 hours free time; $3 for the second day; $4 for the third day and $5 for the fourth and subsequent days, is entirely too high and places an unreasonable burden on shippers generally.

Norton, Va.—Papers of incorporation have been filed by the Virginia Coal Products Corporation, of Tacoma, Va., with a capital of $1,500,000. It is understood that with the purchase of the properties of the Fork Ridge Coal Co., Guest Mountain Coal and Coke Co., and M. J. Miller, aggregating about 4,000 acres of fine coal land, the corporation will start the erection of a modern byproduct coking plant that will cover about nine acres and cost about $3,000,000. Promotion of this enterprise is due to the efforts of Dr. W. J. Sproles, of Asheville, N. C.

Uniontown, Penn.—It is stated that Judge Martin A. Knapp, in the United States Circuit Court of Appeals, recently granted an order restraining the sale of J. V. Thompson's properties in Monongalia County, W. Va., The order made by Judge Knapp restrains the sheriff of that county from selling the Thompson properties for taxes until the United States Circuit Court of Appeals has decided the pending appeal from the decision of Federal Judge Dayton, who suspended the receivership appointed for Mr. Thompson in West Virginia.

Cincinnati, Ohio—An agreement has been filed in the United States District Court by counsel for the Central Trust Co. of New York and the Federal Government, in the so-called soft-coal trust case, for the dismissal of the appeal to the Supreme Court from the decision of the Circuit Court of Appeals directing the sale by the railroads involved of certain securities giving control of the coal properties. This action was taken to enable the final disposition of the case by the sale to John S. Jones, of Chicago, of the securities in question, and the Circuit Court of Appeals will probably end the case by decreeing accordingly.

Whitesburg, Ky.—Officials of the Louisville & Nashville Railroad Co. have announced that they will not allow their own cars to go further than the terminals of Louisville and Cincinnati so as to meet the demands of local shippers. This will considerably handicap coal operators in the eastern Kentucky field, which is reached by the L. & N. as at least 75 per cent. of the product goes beyond these terminals—in fact, three-fourths of the output of the mines of this section goes to the Great Lake region and points in the Northwest. Already the car shortage has become a serious menace to coal operators all over the Kentucky field.

Buffalo, N. Y.—The Wellman-Seaver-Morgan car dump, being built by the Delaware, Lackawanna & Western Railroad Co. on its property at the mouth of Buffalo River is so far completed that a 7,500-ton cargo was loaded there last week. The dump is of the ordinary pattern, but has all the latest appliances and is said to be the most complete of its sort in existence. So far the steam used is provided by locomotives, but the steam plant will be finished in a week or so. An effort is being made by the city authorities to induce the Government not to build a protecting dolphin about it, as this would narrow up the channel of the river unnecessarily.

Washington, D. C.—Practically all the railroads of the country have filed tariffs setting aside the present flat rate of $1 a day demurrage on cars not loaded or not unloaded within 48 hours after they are ready for the shipper or consignee and substituting a graduated scale of demurrage. This new demurrage scale, effective Dec. 1, will permit the railroads after the 48-hour free period to charge $2 the first day, $3 the second day, $4 the third and $5 for the fourth and each succeeding day. It is expected that such demurrage will give more prompt despatch of equipment throughout the country, materially relieving the serious car shortage now felt. This schedule is subject to protest and several complaints have already been filed by shippers alleging that it is too drastic.

Cincinnati, Ohio—A committee of operators with mines on the lines of the Chesapeake & Ohio Railroad Co. in West Virginia met here with officials of the company a few days ago, for the purpose of discussing the car situation. The coal men were desirous of a better car supply, declaring that they could load double the amount of coal now being shipped, if the cars were available. The railroad officials stated that the scarcity of cars is due to the failure of connecting lines, especially in the North, to return cars. The operators suggested in answer to this that legal proceedings be taken by the railroad to compel the return of the cars. They pointed out that coal operators are not benefiting to any extent by the present high prices of coal, as they are for the most part shipping under contracts made some time ago.

Philadelphia, Penn.—It is understood that negotiations are under way for the sale of the coal holdings of the Susquehanna Coal Co. to some one of the large producing interests. The Susquehanna Coal Co. is owned by the Pennsylvania R.R. and following a decree of the Government in September, 1913, the property was advertised for sale, but no favorable bids were received. The holdings of the coal company, consisting of 25,000 acres of coal land, were valued at that time at $8,000,000. It is understood at this time that the company expects to realize at least $20,000,000 for the property. For a time it was reported that the purchaser would be the Lehigh Coal and Navigation Co., but the officials of that company deny that they are in any way interested. It is felt, however, that announcement of the transfer to new interests will be made in a few months.

Market Department

GENERAL REVIEW

Big deficiency in reserve stocks of anthracite and production light. Bituminous makes the biggest advance yet recorded but the market is very sensitive. Increased shipments on contracts in the Lake district. Very stiff bidding for free coal in the Middle West.

Anthracite—The current situation in hard coal is comparable only with the hard winter of 1902 and 1903 during the big anthracite strike. At no time in years has the production for this period been so small, and it is clear that there is a serious shortage. A further alarming aspect of the situation is the fact that we know of several specific instances where supplies aggregating several million tons that are always carried in storage at this time, have been completely cleaned up; as this coal is relied upon largely to assure adequate supply through the winter period, this certainly presents grave possibilities. The scarcity of cars and shortage of motive power are responsible in part for the scarcity, but the chief difficulty lies in the paucity of labor and growing unrest among the miners. Local strikes involving relatively large numbers of men are seriously cutting down the production, while the occurrence of three holidays already this month, with at least one more to come, offers little encouragement for hopes of an increase in the supplies. One encouraging feature is the fact that summer production ran somewhat above normal, though this will soon be wiped out by the deficiency now developing.

Bituminous—The relatively easy price advances of 25 to 50c. per ton have now given way to violent increases ranging from $1 to $2 per ton between quotations. Each week sees already record prices replaced by still higher quotations, and there is apparently no limit to what the market may touch before Jan. 1. That the market is very sensitive, however, is evident by a tendency toward softer quotations on rumors of a big improvement in the car supply, though these rumors later proved to be wrong. Of course it is understood that these high prices apply only to what little free coal there is available in the market, which is a very small tonnage after contract obligations have been met. Stocks at tidewater have about disappeared completely, and exports have touched the lowest point for a long period, no coal whatever having been exported from Baltimore for the first time in a number of years. Active bidding for tonnage to fill vessels threatened with demurrage has been a potent influence in the spectacular advance in tidewater quotations.

Lake Market—Very energetic efforts on the part of the operators to increase shipments on contracts has tended to relieve the urgent pressure for coal in the spot market, though buying is still active with a more insistent demand from other large consumers who must have increased tonnages. Prices are at new high levels in all directions and the situation much mixed in this respect. State and Federal investigations of the car shortage problem are only serving to increase the nervousness of the market and some buyers in urgent need of tonnage are going direct to the mines and offering extravagant prices for immediate delivery. Indications of a panic are developing where buyers find it impossible to replenish their supply. Receipts of coal at the different distributing centers are by actual count found to be running as low as 50 per cent. normal at some points, and some public service corporations are finding it impossible to obtain bids on expiring contracts. It seems doubtful now if the cessation in Lake shipping will benefit the situation materially.

Middle Western—An unparallelled situation has prevailed during the last week, with buying of a desperate nature. For instance, coal has sold at the mines at figures occasionally exceeding the highest point ever before reached at destination. Differentials as to grades, sizes, and quality have been entirely wiped out, and the appearance of any free coal of any kind precipitates the stiffest kind of bidding. It is developing that some retailers who failed to accumulate their necessary stocks at the low summer level are now being obliged to stand losses on every ton delivered to their customers. The distribution of Middle Western coal continues to spread out over still new markets. A typical instance is the shipment of 300 cars of screenings to Detroit, and we also note shipments to various points as far back as central New York. Demand from the Northwest is likewise of a most urgent character, while an entirely new and extensive market has been opened up to the Southwest by the strike at the Oklahoma mines.

A Year Ago—Anthracite trade marking time pending arrival of colder weather. Shipments are behind last year, and general tone excellent. Bituminous just holding its own. High record ocean freights restrict exports. Contradictory developments at interior points.

BUSINESS OPINIONS

Boston News Bureau—People as a rule are most optimistic. Money is so abundant that no trouble is experienced in financing the largest operations. There is such a world demand for commodities that there is a shortage of products and a shortage of equipment. Now with the election over one menace will be removed. There will be more disposition to pay attention to fundamental features.

Iron Age—The pig-iron market shows a continuance of the excited conditions of the past two weeks, with further sharp advances in price. At the same time the action of steel products has confirmed the predictions of higher prices and of full occupation of the mills throughout 1917. The political tension of the week and the closeness of the election have apparently had no effect on the buying of iron and steel. Probably no week during a national election has shown more activity in those markets. Last week's sensational advances in pig-iron did not check, but rather stimulated, buying, but the market is in confusion over wide variations in prices and the withdrawal of a good many sellers, particularly on business for the second half of 1917. Some of the new advances are without a parallel for a single week.

American Wool and Cotton Reporter—Every kind of wool is strong, and during the week under review it didn't seem to make much difference which way the election was going as far as the wool market was concerned. Sales for the week were 15,000,000 lb. The week under review was more active than any for a long time. Business was transacted at advance prices, and there is every indication that these high figures will continue. The urgent need of the dealers to get something to sell as well as the scarcity of the wool has forced prices higher than they have been for some time. The market has a more solid foundation than any previous high market has had.

Bradstreet—Active business, with little or no political excitement, superabundant activity and not enough materials to go around, animated industries with too few producers to get out needed supplies, farmers getting high prices and paying up old debts, record railway earnings, acute car shortages, unparalleled railway tonnage, extraordinarily good collections, easy money, high cost of living and noteworthy speculation are the striking characteristics of this week's reports. The Presidential campaign has been a negligible factor in relation to business, the volume of which is of unexampled proportions. Goods are in demand for immediate use and for delivery next spring and beyond. Overproduction is still out of the question, as the country's plants are undermanned, and at the same time consumption is of enormous volume. The tendency to withdraw quotations on articles intended for forward delivery is spreading, and probably will proceed apace as the necessity for checking upbidding as well as restricting demand is recognized.

Dun—Neither the pending elections nor the persistent rise of prices have perceptibly reduced the momentum of the business movement. Activity continues unabated at a time when more or less hesitancy is usually witnessed, and it remains a wonder that with costs mounting steadily, and in many cases rapidly, demands are sustained in such great volume. New buying for current and forward requirements still outstrips the facilities for both production and distribution, labor conditions and the growing scarcity of materials acting as a brake on manufacturing in many directions. Commercial failures this week in the United States are 279 against 289 last week, 297 the preceding week, and 359 the corresponding week last year.

Dry Goods Economist—The oversold condition of the market in many lines is reflected in complaints which have reached us from retailers as to nondelivery of goods. There is reason to believe that in too many cases orders have been accepted for fear of offending the customer and more in the hope than the expectation, of the seller's ability to fill them. Such methods are by no means the rule; commission houses, for example, are not permitted to accept any large contracts, such as usually require three months for delivery, without first conferring with the mill.

Marshall Field & Co.—Wholesale shipments of dry goods for the current week have been well ahead of the past few weeks and exceed the volume of a year ago by a considerable margin. Road sales for both immediate and future delivery show splendid gains over the same week 1915. Customers have been in to market in much larger numbers. Collections continue greatly in excess of last year. The market on domestic cotton goods is firm and advancing.

Atlantic Seaboard

BOSTON

Pocahontas and New River prices up to strike levels, but no comprehensive sales are made. Receipts still very light. Georges Creek deliveries entirely ceased. Prices on Pennsylvania grades the highest in years. Anthracite trade on the verge of a panic.

Bituminous—There seems no limit to the prices that may be asked between now and Jan. 1. From modest advances the shippers who have free coal are jumping 50c. and $1 at a time, so that $7 f.o.b. is at this writing a fair average of the quotations made on smokeless coals for spot shipment. Free coal, however, except in a few cases, is confined to shippers who ordinarily contract for only a percentage of their usual supply. Those who are normally active in the coastwise or export market have so many obligations on which to apply their reduced receipts that the volume of available coal is measurably small.

Factors here who have steamers on weekly trips are already hard pushed to get their boats loaded in anything like usual time. Some large concerns who have contracts with more than one or two shippers are pressing them all to furnish part cargoes, in that way making up the aggregate quota of a ship. Car supply is wretched and there is much ground for alarm.

The remarkable thing is that there is less heard here about bituminous shortage than about anthracite. The high figures prevailing at Hampton Roads are in part the outcome of situations where shippers or charterers find themselves with boats on their hands and an insufficient volume of coal to load. At times lately five different shippers have furnished coal to make up a single cargo.

Practically all the New River and Pocahontas agencies have been able so far to keep up with their contracts, and what few purchases have been made on a delivered basis have been either by consumers who neglected to buy enough early in the season or by those who placed too much dependence upon getting their normal supply of grades other than those from the Virginia capes; the proportion of the former, however, is rather small. At this writing, $7.60 is the highest figure reported on a cargo lot alongside Boston, but $9 on cars Providence has already been paid for smaller quantities.

The only Georges Creek available at all is at Baltimore, and there the supply is almost negligible. Bottoms that have waited a week for cargo have in more than one instance loaded part or all high-volatile grades from West Virginia.

There is rather less activity in water-borne Pennsylvania grades than was expected. Retail dealers have been buying liberally to make up the arrears on other coals, Georges Creek chiefly, but for the same reasons noted on Pocahontas and New River there is yet no very comprehensive demand. Due to intermittent embargoes against both the New Haven and the Boston & Maine the trade inland from Tidewater has been quite brisk. This is particularly true from Portsmouth, N. H., and from Portland, Me., where leading factors are not able to supply coal in quite the volume their customers had reason to expect. Water is lower for the mills and there is so much over-time among the textile plants that their requirements are greater than anticipated. Where that is the case the price of coal is not so important.

All-rail the pressure to get coal forward continues unabated. Some very, very high prices have been reported; for instance, $6.75 f.o.b. mines for West Virginia high volatiles. The same figure has been paid for choice grades from Cambria County.

The usual crop of small mines has sprung up; unable to produce under ordinary conditions they now come into the market for some of the lucrative business. At New York the demand is much excited and at Philadelphia only less so. There are fewer shippers with coal on hand than was the case a week ago, although it may be expected that the high level of prices will attract somewhat better shipments to Tidewater the next week or so.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. & Som's't	Geo'gs. Creek*
Philad'la...	$4.75@5.50	$5.50@6.50	.....
New York..	5.10@5.80	5.80@6.80	.....
Baltimore..	.....	.....	.....
F.o.b. mines	3.50@4.25	3.75@4.75	.....

* On contract.

Pocahontas and New River are quoted at $5.50@7, f.o.b. Norfolk and Newport News, Va., and $8.50@9 on cars Boston and Providence for inland delivery. Clearfields range from $7.75@8.25 alongside Boston for spot cargoes, and about the same for small lots on cars.

Anthracite—Except for the high figures on independent coal in this territory there is little to add to earlier reports on the status of domestic sizes. The number of companies regularly shipping to their trade is gradually narrowing down. Towing rates have been advanced for those barge lines dependent on outside power and with loading so discouragingly slow it is not strange that New England is not being so much favored in the allotment of coal as would be the case in a normal season. As for independent coal, present quotations are as high as during the hard season in 1902-3; $13.25 is reported as a price alongside Boston for an assorted cargo with a proportion of stove and $11 is frequently heard as a price for chestnut f.o.b. cars Boston or Providence.

The recent advance of 10c. by certain of the companies, even on top of a previous advance of 20c. or so in barge rates, New York to Boston, creates no comment, so dead anxious are dealers to get coal at any price.

The Boston retailers again advanced prices on Nov. 3, so that their present list is as follows:

Broken	$8.50	Pea	$7.50
Egg	9.50	Shamokin	10.00
Store	9.50	Franklin	11.00
Nut	9.50	Bituminous	6.50
		Screenings	4.00

Orders are being accepted for 1-ton lots only, and every effort is made to confine sales to regular customers. In Haverhill and Lawrence, Mass., prices are $13 and $14; $8 has been paid f.o.b. mines for stove coal.

PHILADELPHIA

Anthracite official opinion differs as to shortage. Newspaper publicity stirs public. Dealers' stocks low. Strong retail demand continues. Steam coals selling at new prices. Bituminous makes another big price advance. Consumers blamed for excessive prices. Car supply and rail movement poor.

The principal receipts in this city are heavy consignments of nut and pea coal from the storage yards of the big companies. The individuals are sending their tonnage elsewhere and are reaping harvests. Only a small proportion of their production is coming to a few selected customers. It is actually a fact that some of the smaller operators have refused to accept business from their best local trade; they returned the dealers' November orders with the information they would be unable to ship. The individuals are, of course, just as badly hampered as the big companies by a shortage of labor and cars, but they greatly exaggerate conditions in order to cover up the fact that they are receiving extremely high prices in other markets.

If the big interests were pursuing the same plan conditions here would be actually serious. Yet the big companies are not altogether without blame. While they are not asking any premiums on their coal here, it is none the less a fact that a fair portion of their tonnage is being sold at a premium by the middle houses, who have become extremely active of late and by some unknown arrangement seem to be able to secure coal from the big companies. On what coal they are getting in this way they are receiving a premium of not less than 50c. per ton on the domestic sizes for local delivery. While all this has been denied in the papers we know that this is the case.

It is interesting to note that small operations in the mining regions are actually carting their product to the railroad two and three miles away and selling to brokers for Western shipment. Ordinarily this coal is sold locally at the mines. Similar to this is a practice which has just been eradicated by the larger mining companies who supply retail dealers in the region with fuel for their local trade. Many of these were loading the coal in cars and selling it at an increased price to brokers in this city.

The situation with the local dealers does not improve and this week quite a number of yards were entirely out of certain popular sizes at times. The dealers have reachel the point where they are beginning to confine their business to their regular trade and are even cutting down the quantity ordered in an endeavor to equitably distribute their coal.

That stove coal does not improve goes without saying. There is no relief in sight and even the big companies do not pretend to keep their trade supplied. It has even been stated that some operators have discontinued making egg coal, as with that size being the lowest in price of all the domestic sizes, except pea, they find it more profitable to break it down into the other sizes. So far as the dealer is concerned this can afford but slight relief and they are inducing their trade to take chestnut and pea rather than take any chances. As stated before, most of these latter sizes are coming from the storage yards.

All the retailers were greatly interested in the announcement of the new $3 price for pea coal. While the companies making the price let it be known that it was to apply only on strictly new business, they have already made sales of a fair tonnage at the new figure. The dealers are now beginning to wonder if the sales at the advanced price will affect shipments to them so far as tonnage is concerned. The same result has been noted in buckwheat No. 1 at the new price of $2, as the new figure was accepted by the steam users immediately. As a matter of fact, bituminous coal has gone to such a figure that more than one big industrial plant has made offers, even for pea coal, to supplement their bituminous supply. A number of sales have also been made of culm to bituminous users at prices ranging from 60c. to 75c. per ton.

The circular prices per gross ton, f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide, are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buck	$2.00	$2.90
Egg	4.15	5.25	Rice	1.25	2.15
Stove	4.10	5.60	Boiler	1.10	2.00
Nut	4.50	5.55	Barley	1.00	1.90
Pea	3.00	3.90			

This table includes the new prices for pea and the steam sizes. While by far the greater proportion of these sizes is being sold (to the old customers) at the former figures, no one could hope to buy any of these sizes now at less than the new figures.

Bituminous—Prices are mounting so rapidly that it is hard to keep up with current quotations. This week the $5 mark was quickly reached and passed, and by the biggest advance yet recorded many sales were closed recently at $7@7.50. Despite these high prices brokers claim that the business is not at all profitable to them, owing to their inability to secure supplies, and they contend that it is purely a producers' market.

The situation has reached the point where those interested are groping about to find the cause of the high prices. Many are blaming the large consuming interests, who in their eagerness to further increase their stocks, have gone into the region and are purchasing the fuel practically at the mine mouth; in this way the mine owners are getting a fictitious impression of actual conditions.

The effort to get fuel in this city has now practically resolved itself into a mad scramble, and it frequently happens that for a day or two there are houses that will not even give a quotation, either not having any coal to offer or awaiting better figures. The car supply has not improved and if anything is even worse than last week and the movement continues particularly bad.

Yet with all these drawbacks industrial plants throughout the city and nearby suburbs have sufficient stocks on hand in most instances to last at least a month and in many cases as much as three months without further shipments being received. Of course, at plants which do not have rail connections this would not apply.

Most all shipping companies have withdrawn their salesmen from the street, as the business is now so urgent that it is transacted directly with the offices. All the railroads centering here are making strong efforts to increase their fuel supplies and in quite a number of instances have confiscated coal en route, which is causing much controversy as to price.

We give below a list of prices per gross ton at the mines, which will illustrate the trend of the market at the time this report is made, although it must be understood that even these figures are not likely to be effective for more than a single day:

Georges Creek Big Vein	$7.00@7.25
South Fork Miller Vein	7.00@7.25
Clearfield (ordinary)	6.75@7.00
Somerset (ordinary)	6.50@6.75
West Va. Freeport	6.25@6.50
Fairmont gas	6.50@6.75
Fairmont gas, mine-run	6.45@6.55
Fairmont gas, slack	5.75@6.00
Fairmont lump, ordinary	6.40@6.50
Fairmont mine-run	6.30@6.40
Fairmont slack	5.75@6.00

NEW YORK

Anthracite still gaining strength. Quotations slightly lower but no coal to be had. Steam coals easy. Further advances in bituminous, some quotations reaching $8. Operations threatened by labor troubles.

Anthracite—The anthracite market continues to show greater strength. Mild weather tended to ease conditions and some middlemen early this week were making slightly lower quotations. Supplies at Tidewater are far below normal and dealers are anxious to get coal.

Conditions continue to be without a parallel. Prices at which sales are reported have seldom, if ever, been quoted even in strike times. Even the most optimistic of the trades fail to see any improvement in the near future. Most of the trouble is attributed to the shortage of cars many of which are being used in the transportation of other commodities. Hundred of thousands tons of production have been lost the past two weeks by the failure of miners to work on Mitchell Day, a church day and Election day this week.

In the opinion of some coalmen the end of the advance is not yet in sight. At the same time dealers are advising their trade to take things calmly and that all can be supplied if they are willing to reduce their orders to actual needs for the time being. In the meantime most retailers have withdrawn their prices and quotations are now subject to market conditions.

Dealers who under ordinary conditions get their entire supply from the companies are now in the spot market picking up stray cargoes to piece out their stocks. The companies continue to take care of their trade by partially filling orders at the regular winter circular.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	5.45	$9.50@10.50
Stove	5.70	9.50@10.50
Nut	5.75	9.50@10.50
Pea	4.00	5.25@6.50
Buck	2.75	4.00@5.00
Rice	2.20	2.50@3.00
Barley	1.95	2.00@2.50
Boiler	2.20	.....

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—There have been further advances and the end is not yet in sight. While the market has not generally reached the $8 mark some shippers were quoting that figure though no sales were reported. There is very little spot coal to be had at any price and the consumer protected by a contract is fortunate even though he is not getting his full requirements.

There is considerable action nowadays and the buyers with ready cash, other conditions being equal, are likely to get the coal. There is no telling when quotations are going to stop advancing, but most dealers appear to be more cautious than they were a few weeks back.

Production while far from normal is again being seriously threatened by a demand for more wages in the Tyrone district of central Pennsylvania. These demands range from 25 to 33⅓ per cent. and in some instances will equal 45c. per ton. Some operators while feeling they are being imposed upon are inclined to grant the demands fearing their refusal to do so would result in a suspension and that the men would go to other mines and get employment. The car supply shows no improvement and in some sections is about the worst ever experienced.

With many industrial plants operating day and night and using at least 25 per cent. more coal many shippers are beginning to realize that the winter demand is going to be exceedingly heavy.

Supplies at Tidewater are down to a low ebb and quotations range from $7.25 to $7.75 with some sales reported at still higher prices. Mine quotations ranged from $6.25 to $6.50 for Beech Creek coals and from $6.50 to $6.75 for better grades. There are rumors that some coals are being quoted at $7 at the mines.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	South Amboy	Port Reading	Mine Price
Georg's Crk. Big Vein	$7.25@7.75	$7.25@7.75	$6.75@7.25
Tyson	7.25@7.50	7.25@7.50	6.75@7.00
Clearfield	7.00@7.25	7.00@7.25	6.50@6.75
South Frk.	7.50@7.75	7.50@7.75	6.50@6.75
Nanty Glo.	7.50@7.75	7.50@7.75	6.50@6.75
Som'r. Co.	7.00@7.25	7.00@7.25	6.50@6.75
Que'ho'ing.	7.00@7.25	7.00@7.25	6.50@6.75
W. V. Fa'rm't Th'r'qua	7.50@7.75	7.50@7.75	6.75@7.00
Mine-run	7.50@7.75	7.50@7.75	6.75@7.00
West. Md.	7.00@7.50	7.00@7.50	6.75@7.00

BALTIMORE

New high price records for all grades of soft coal. Anthracite men working on narrow margin. Despite better car supply many plants are near the danger line.

Bituminous—All high records for the soft coal price have been smashed. For several days past steam coals have been selling at the mines around $6.50 to $7 a ton, while gas coals command a mine price of $6 to $6.50. The jump of the week was between $1.50 and $2 a ton, another high mark after coals had already touched record figures. Once or twice, on Saturday and Monday, when reports came through that the Baltimore & Ohio had supplied nearly a full car allotment to the West Virginia mines the prices wavered slightly but soon regained their strength.

Terminals here have been swept practically clear of coal and the demand is so heavy from industrial plants that even a liberal supply of coal here during the balance of the week would be quickly absorbed at good figures. For the time being prices to the trade at the mines are being held firmly as follows: Georges Creek, Tyson, $7 to $7.25; Somerset, $7; South Fork, $7; Clearfield, $6.50; Quemahoning, $7; Latrobe, $6.50; Freeport, $6.50; Fairmont gas, ¾, $6.50; mine-run, $6.25; slack, $6.

Anthracite—Hard coal men are in a quandary. Not one-fifth of the amount of coal needed to fully meet orders on the books is coming through. Several days the past week, despite offers of premiums, there were practically none of certain

grades to be had. As a direct change from the conditions a week before, pea coal was in better supply than the larger sizes.

Exports—Not a single vessel was cleared from Baltimore with fuel for foreign ports, during the entire week. Two vessels reported for coke cargoes but the orders could not be filled. During October last, unofficial figures show a total export movement from Baltimore of 57,912 tons, as against more than 92,000 tons sent out in September.

HAMPTON ROADS

Exports lighter this week. No change in coastwise movement. Shortage of coal still acute. Prices higher.

Delayed arrival of steamers has caused a temporary slump in exports. Coastwise vessels, on account of the short voyage and quick discharging make more regular voyages and shipment is seldom curtailed by the failure of vessels to arrive when expected. The majority of the tonnage shipped coastwise is on contract while a good portion of the shipments foreign is not under contract.

There is no stock on hand at Hampton Roads and receipts are falling behind requirements. Nearly all cargo vessels are meeting with delay on this account. The car situation seems to be getting worse all the time and no relief is in sight. The Chesapeake & Ohio has appealed to the courts in an effort to secure the return of its cars on connecting lines.

Prices still continue to soar and some shippers are of the opinion that Pocahontas and New River will be bringing $10 per ton f.o.b. Hampton Roads by the first of the year. Anthracite is also increasing in price, though not showing the sensational advances of Pocahontas and New River. Dealers report only a limited supply of anthracite on hand, and it is understood supplies are not being replenished to any extent.

Bunker demands are very heavy, both as to number of boats and tonnage required. Shippers have not yet named prices for this business over next year. Freight rates are at about the same levels as recently quoted, Hampton Roads to Boston about $2 and about $10.80 to the Plate. Shippers are receiving more inquiries than they are able to handle and prices are advancing from day to day. Consumers seem hardly to believe that prices have reached such high levels until they go into the market. Based on actual sales at this writing, prices are as follows: Pocahontas and New River for cargo, export and coastwise shipment, $7.50@8 per gross ton; on track for local consumption $7@7.50 per net ton; bunker coal, $7.50@8; anthracite, $9 per net ton delivered.

Ocean Shipping

OCEAN FREIGHTS

Since our last report freight rates to the West Indies and to Cuba have advanced, and orders for these destinations are accumulating, owing to the scarcity of tonnage. Rates to other destinations are unchanged. The only recent charter of interest was the fixture of the Chilean steamer "Maipo" for about 6,000 tons of coal and coke from Baltimore or Philadelphia to Callao at $8 and $12.

We would quote freight rates on coal by steamer as follows:

	Oct. 30	Nov. 6
West Coast Italy	$26.40@27.60	$26.40@27.60
Marseilles	24.00@25.20	24.00@25.20
Barcelona*[2]	21.60 about	21.60 about
Montevideo	12.00 about	12.00 about
Buenos Aires	12.00 about	12.00 about
Rosario	13.20 about	13.20 about
Rio Janeiro	11.00@11.50	11.00 about
Santos	11.50@12.00	11.50 about
Chile (good port)	8.00 about	8.00 about
Havana	3.50@4.00	3.50@4.00
Cardenas, Sagua	5.00 about	5.50@6.00
Cienfuegos	4.50@5.00	5.50 about
Port au Spain	6.50 about	6.50 about
St. Lucia	6.50 about	6.50 about
St. Thomas	5.50 about	5.50 about
Barbados	6.50 about	6.50 about
Kingston	4.50@5.00	5.00@5.50
Curacao[1]	5.50 about	5.50 about
Santiago	4.50@5.00	5.50 about
Guantanamo	4.50@5.00	5.50 about
Bermuda	4.50@4.75	5.00@5.50
Vera Cruz	5.50 about	5.50@6.00
Tampico	5.50 about	5.50@6.00

* Spanish dues for account of cargo. [1] And p.c.
[2] Or other good Spanish port.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

COASTWISE FREIGHTS

Two dollars continues the rate from Norfolk to Boston, with inquiry still very light and shippers reluctant to accept boats. A few barges are available at the same rate from Philadelphia, although it has to be said that the inquiry there is restricted to only the few shippers who have coal on hand. An occasional schooner returned from off-shore in order to get to Boston for an outward cargo will make a small concession to get a coal freight; $1.75 continues the figure for Fall River and New Bedford charters; $1.50 has been asked this week on barges for Providence, New York loading, but $1.35 remains the upset rate actually paid; $2.50 is still being paid from New York to points not East of the Penobscot. It is possible that marine freights might ease off a little on account of the few shippers who have coal to load were it not for the panic demand for anthracite out of New York and Philadelphia.

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Bylayl[1]	Rio de Janeiro, Brazil	4,092
Denis[5]	Pernambuco, Brazil	787
Battinin Accame[1]	Genoa, Italy	4,166
Fortunata[1]	Genoa, Italy	4,198
Maria C.[1]	Genoa, Italy	4,285
Araguary[6]	Rio de Janeiro, Brazil	3,199
Granville R. Bacon[3]	Hamilton, Bermuda	532
Calumet[5]	Bahia, Brazil	1,800
Carlo[6]	Italy—Any port	7,040
Capri[1]	Genoa, Italy	443
Kenuta[7]	Callao, Peru	1,007
Mafalda[3]	Rio de Janeiro, Brazil	2,040
Harald[4]	St. Thomas, D. W. I.	4,607

NEWPORT NEWS

Tea[2]	Italy—Any port	7,211
Margarcia[2]	Cayo Francis, Cuba	1,849
Sorata[7]	Callao, Peru	3,375
Tiberia[6]	Mejillones, Chile	6,946

PHILADELPHIA

Cratheus	Puerto Padre	799
Panama Transport	Santiago	
Josey	Havana	1,670
Skogstad	Fort de France	2,357
Munrio	Havana	
Honduras	Santa Marta	
Margaret Thomas	San Juan, P. R.	1,161

BALTIMORE

There were no foreign shipments from Baltimore during the week; the first time this has happened in a number of years.

[1] Pocahontas Fuel Co. [2] Berwind-White Co. [3] Castner Curran & Bullit. [4] Baker-Whiteley Co. [5] Smokeless Fuel Co. [6] C. H. Sprague & Son. [7] Eastern Coal & Export Corporation. [8] West Virginia Coal Co. [9] C. & O. Coal & Coke Co.

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

Vessel	Destination	Tons	Rate
Florence Creadick	Cardenas	1,800	
Malin	Cuba	893	
Cratheus	Puerto Padre	799	
Skogstad	West Indies	2,357	
Hugo	Havana	869[1]	
Edward Sewall	Galveston		

BALTIMORE

Rockingham	Chile	2,875[2]	
Kirkdale[3]	Chile	3,047	$8.40

VIRGINIA

Asuncion de Larrinaga	Bahia Blanca	2,683	10.80

[1] Coal and coke. [2] Coke. [3] Or Virginia.

Lake Markets

PITTSBURGH

Broader demand for spot coal and still higher prices. No relief in sight.

The coal situation has continued to grow more acute. The steel mills are buying prompt steam and gas coal as formerly. They may not be taking such large tonnages from the spot market as two or three weeks ago, due to the fact that the most strenuous efforts are being made to improve shipments, on contract, but there is a more insistent demand from other consumers, such as public service corporations, which have run through their limited stocks and must have larger shipments.

While the consumptive demand is heavy, the pinch is caused by car shortage and consequently reduced production. The large coal-producing companies are making less money than formerly, as they are shipping less coal. Some of the small producers, who do not do much in the contract line, are making what for them are fabulous profits, but the industry as a whole is suffering. Some profits will come later, of course, when shippers are relieved of the necessity of making Lake shipments. It is now well recognized that the cessation of Lake shipments will not make coal plentiful, as this cannot entirely relieve the car shortage, particularly with bad weather only a very few weeks ahead.

Coal prices cannot be quoted closely. Steam coal is about $5.50 per net ton, f.o.b. mine, Pittsburgh district, with gas coal about $6.25. Slack runs about 50c. below mine-run, while screened coal might be quoted at the usual differentials above mine-run, but differentials are practically lost. Apparently the steel mills are more short of gas coal, for their gas producers, than of steam coal.

BUFFALO

Prices still advancing. Jobbers making big profits. Stampede for anthracite increases individuals' prices. Lake shipments behind.

Bituminous—The situation is such that nothing like a regular price is to be had. Both the mines and consumers are at sea as to prices. The jobber refuses to do business at former profits, and enough sales are made at big profits to make the aggregate large. As high as $3 a ton profit to the jobber is occasionally reported.

At the same time it must be remembered that the great bulk, perhaps 75 per cent., of the coal is moving on contract at spring prices. Some shippers are paying little or no attention to single orders and giving all their time to filling contracts.

Price quotations are little more than guesswork, as the consumer pays what he must. Figures per net ton, f.o.b. Buffalo, are:

Youghiogheny Gas	$7.25@7.75
Pittsburgh Steam	7.00@7.50
Ohio No. 8	7.00@7.50
Allegheny Valley	6.80@7.30
Pennsylvania Smokeless	6.50@7.00
All Slack	6.25@6.75

Anthracite—The market is about as excited as bituminous, though Buffalo retailers are following the shippers in adhering to circular prices. The demand is far beyond the supply, but chiefly because the consumers are scared and are looking for $12 coal. Standard shippers say there is no cause for alarm and that the consumers are assisting the independent jobbers in making fictitious prices. Teams wait all day at the local trestles and if the coal gives out before they are reached they go home for an earlier start next day.

Independent jobbers are asking all sorts of premiums, often getting $4 above circular or any price they may ask. The regular quotations remain to buyers in car lots, as follows:

Grate	$5.85	Chestnut	$6.35
Stove	6.10	Pea	5.00
Egg	6.10	Buckwheat	3.50

Prices are all f.o.b. cars, with 25c. per ton additional for delivery on board vessel.

The Lake trade is without much change, shippers refusing to respond to local clamor and turn any more than the usual proportion into the city trade. It will be easier to meet that demand when the Lakes close. Shipments by Lake for the week were 73,575 net tons, of which 36,600 tons cleared for Duluth and Superior, 20,500 tons for Chicago and 12,850 tons for Milwaukee. Freight rates are fairly easy at $1 for slow Lake Michigan docks and 75@85c. for fast docks, Lake Superior still paying 30@40c.

Lake shipments for October were 327,785 tons, as against 521,171 tons during October last season. Present season to November, 2,269,946 tons, as against 3,383,246 tons to the same date last season.

TORONTO, CAN.

Coal situation becoming serious. Great shortage of bituminous with advancing prices. Consumers anxious to stock up but deliveries much delayed. Dealers refuse to make contracts.

The coal situation is becoming serious. The demand is very active as many consumers in anticipation of higher prices are anxious to lay in stocks. There is a great shortage of bituminous and deliveries both by rail and from the local yards are much delayed. Dealers refuse to make contracts with large consumers, including hotel and apartment-house managers on account of uncertainty in prices. The Canadian Pacific Railway has placed an embargo on interchange switchings at Toronto.

Quotations are as follows with an upward tendency for bituminous: Retail anthracite egg, stove and nut, $8.50; grate, $8.25; pea, $7.50; bituminous steam, $8.50; slack, $7.50; domestic lump, $7.50; cannel, $8. Wholesale f.o.b. cars at destination bituminous three-quarter lump, $8; slack, $6.75; Pennsylvania smokeless run-of-mine, $7. Pocahontas smokeless is not in stock but can be ordered from the mine at $8, f.o.b. destination.

CLEVELAND

Prices remain firm. State and Federal Government inspectors investigating conditions. Demurrage charges to be increased.

The prices of coal at the mine have been hovering around $5 for all grades and show no tendency to decline. In fact, one or two cold days would create a still more urgent demand which would make prices soar still higher.

The state and Federal Government inspectors have been investigating the story that jobbers have been holding great quantities of coal on track for speculation. They counted the cars in the Cleveland railroad yards and adjoining

storage tracks outside of city limits and found on the day of their investigation that there were 460 cars of coal on hand; 70 of these had been ordered reconsigned out of town and 50 were for Lake trade, leaving only 340 cars for local consumption, the daily requirements being about 700 cars. The daily receipts of coal for local consumption for the past week have only averaged 125 cars on all railroads. The investigators are trying to blame the jobbers and coal dealers for holding up cars on which they only have to pay $1 per day demurrage.

The City of Cleveland opened bids on Nov. 1 for approximately 45,000 tons slack for the waterworks department for one year. They received only one bid, and that was from the Valley Camp Coal Co., who bid $3.50 per net ton, f.o.b. cars Cleveland. Last year the city only paid $1.67 a ton. The fact that only one concern submitted a bid was cited as an example of the condition of the coal trade. The city officials have not yet decided whether they will accept this bid.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$5.75	$5.75	$5.75
Cambridge	5.75	5.75	5.75
Middle Dist.	5.75	5.75	5.75

No quotations can be made on Hocking, Youghiogheny, Pittsburgh, Pocahontas and Fairmont.

DETROIT

Growing scarcity of steam coal threatens suspension at some industrial plants. Domestic stocks are also low. Lake movement much curtailed.

Bituminous — Manufacturing establishments, which are not receiving coal under contract and have no facilities for maintaining a reserve supply, are facing the possibility of having to close in the near future. Even the municipal lighting plant here has only 10 days' supply of fuel on hand.

Bituminous coal of almost every description is being quoted at about $5.50 at the mines, regardless of size or quality, while the demand from steam-coal users is urgent. Were it not that the weather continues rather mild, consumers of domestic coal would be in a serious predicament as retailers' stocks are dwindling rapidly. They are making an effort to distribute the coal as far as possible by limiting deliveries.

Anthracite—With little anthracite coming to Detroit and a strong demand, retail prices generally remain at the figures fixed in September, $8.50 for stove and egg and $8.75 for chestnut. Premiums as high as $2 a ton are reported paid by dealers to supply requirements of their customers. Even some of the larger dealers are said to have very little stock remaining.

Lake Trade—Inability to get coal delivered at loading docks is causing serious trouble for shippers in the Lake trade. Some of them are not able to obtain enough coal to bunker Lake steamers they are under contract to supply. Efforts of some of the freighters to obtain fuel at the head of Lake Superior have been met with a refusal from the dock managers as the supply on hand is already insufficient for the needs of the Northwest. Very few freighters are being loaded with coal for the upbound trip.

The lessened movement of coal is apparent in the report of the St. Marys River canals for October, showing 279,350 short tons of anthracite and 1,457,717 short tons of bituminous carried through those waterways, a decrease of 24,537 tons of anthracite and 414,361 tons of bituminous, compared with September. In October, 1915, 260,188 tons of anthracite and 1,643,283 tons of bituminous moved through the canals, while 237,710 tons of anthracite and 1,609,111 tons of bituminous were handled in the same month of 1914.

COLUMBUS

Prices still soaring and car shortage is becoming more pronounced. Higher levels are freely predicted.

The market continues to record higher levels and a continued scarcity of stocks, which has reached an alarming stage. With warm weather, such as has been prevailing, dealers have been able to keep their customers going, but fear is expressed when the first cold spell arrives. It is believed that considerable suffering will result, unless something is done to relieve the situation.

Large steam consumers are making frantic efforts to pick up all free tonnage available in order to accumulate a slight surplus against an emergency; some have only stocks for a few days and are operating from hand to mouth. Public utility concerns are short of stocks and widespread suffering might result from a still further curtailing of production. Railroads are taking a large tonnage for the movement of trains and in some instances have confiscated cargoes.

Domestic trade is about in the same condition. Retail stocks are light and dealers are compelled to apportion their available supplies among many customers. Householders are making efforts to get in their winter supply but have not been very successful. Anthracite is scarce and prices are extremely high. Chestnut is selling at $10 in the local market. There is also quite a scarcity of Pocahontas and West Virginia splints. Hocking grades are about as scarce as other varieties. Dealers in the smaller towns appear to be shorter of stocks than in the city.

Lake trade is still attracting some attention and a considerable tonnage is going to the head of the Lakes; prices are stronger. Bottoms are scarce and it is now practically impossible to charter vessels. The Toledo docks of the Hocking Valley handled 97,000 tons during the past week.

Production is still further curtailed by lack of railroad equipment. Most of the Ohio districts are producing only about 50 per cent. of normal. There appears to be no immediate signs of relief in the car shortage.

Prices on short tons, f.o.b. mines, are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$5.00	$5.50	.....
Inch and a quarter	5.00	5.50	$5.00
Three-quarter inch	5.00	5.50	5.00
Nut	4.75	5.00	4.75
Egg	4.75	5.00	.....
Mine run	4.75	5.00	4.75
Nut, pea and slack	4.75	5.00	4.75
Coarse slack	4.75	5.00	4.75

CINCINNATI

Panicky buying developing due to continued reports of car and labor shortage, and increasing consumption. Mild weather has kept down domestic demand.

The possibility of an actual shortage of fuel, resulting in state and Federal investigations of the car shortage, has increased the nervousness of the market, as might have been expected. Some large steam consumers have gone direct to the mines, offering extravagant prices for coal for immediate delivery. The car shortage, coupled with heavy industrial and railroad fuel requirements, continues to be the chief factor, the maximum supply being around 50 per cent. and the minimum as low as 30 per cent.

Continued mild weather has fortunately kept down the domestic demand on the dealers, but they are in the market in full force. Another factor which must be considered in this market is an increased gas rate, many consumers having decided to take gas out of their furnaces and use coal.

LOUISVILLE

Condition in Kentucky fields becoming even more desperate, with sales sometimes on almost an auction basis. Balmy weather tending to postpone severest pinch. L. & N. tightens hold on its cars.

A condition that is on the verge of desperation prevails in the Kentucky market, with consumers showing evidences of panic where they find it impossible to replenish their stores. Continued warm weather has postponed the inevitable stringency in the domestic market, although prices threaten further advances and supplies of coal in dealers' yards are extremely low. The Ohio River cannot be relied on for relief, the stages being on the decline at this time. A more drastic embargo by the Louisville & Nashville holds out hope for Kentucky consumers and industries on the company's lines, although Northern consumers are protesting vehemently against this step.

Prices are hardly in line anywhere, and although they are now the highest on record, are not believed to have reached the top. Eastern Kentucky sales f.o.b. the mines have been noted as high as $4.25 for block, $3.75 for round, $3.60 for mine-run and $3.50 for nut and slack. Western Kentucky operators report sales of lump up to $3 a ton, or better, while there is no nut and slack or similar coals on the open market and contracts are not being covered. Two operators said they had standing orders to ship all the lump they had to Memphis dealers at $2.75, but are not shipping any, having found other buyers keen to pay $3 for the same coal.

BIRMINGHAM, ALA.

Steam coal prices continue to advance, as the limited supply of free coal is feverishly bought up. Car supply around 50 per cent. of demand, which precludes increased production or movement.

Prices on steam coal are making steady strides upward and will doubtless reach $5 per ton at the mines in a short while, in the event there is not a very material increase in the car supply. Much of the business booked during the past week was taken at $4 per ton. Inquiries were received from points in Indiana, Pennsylvania, Ohio and other equally distant territory.

The tonnage of free coal in this district is woefully inadequate and railroads and industrial plants are obliged to lend all possible assistance to secure sufficient equipment for the movement of enough of their contract coal to meet actual needs. Several of the larger companies have submitted bids on the requirements of the New Orleans Railway and Light Co. for the next two years, which will approximate 375,000 tons, and awards will be made shortly.

Some portions of the field report the car shortage as more serious than a week ago; but 50 per cent. of the demand about correctly represents the supply. This necessarily compels half-time operations at many of the mines.

Coke

CONNELLSVILLE

Spot furnace coke slightly higher, with spot foundry much higher. Average production somewhat increased and demand very much increased.

Coke has continued extremely scarce, and furnace coke for spot shipment is a shade higher than a week ago, having commanded $7.25@7.75 in the past few days. Foundry coke for spot shipment has undergone a sharp advance, as it had lagged behind furnace coke in the advance, but now commands an unprecedentedly high premium over furnace. Sometimes there has been a large premium on account of shortage of box cars, but at present probably three carloads out of four sold for spot shipment are in gondolas, the operators using their limited supplies of box cars for shipping on contract. Spot foundry coke has brought as high as $9.50 from dealers, or about $10 from consumers.

In a general way the production of coke has not been curtailed but is perhaps a trifle heavier than a month or two ago. The demand is much greater, as the blast furnaces have been working particularly well and there is demand from outside points, such as the copper producers of the Northwest.

Negotiations for furnace coke on contract are practically suspended. Approximately all the prospective production appears to be under contract already, but if operators have any surplus production beyond their present contracts, they would be indisposed to sell at the present time.

The market is quotable as follows: Spot furnace, $7.25@7.75; contract, nominal, $4; spot foundry, $9@10; contract, $5@5.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville regions in the week ended Oct. 28 at 430,331 tons, an increase of 32,235 tons, and shipments at 417,862 tons, an increase of 20,262 tons.

Buffalo—The market continues strong at about former quotations, the continued shortage of cars being the chief cause of the high prices. Consumers have very little control of the situation and will have to pay asking prices as long as they can run at a profit. Jobbers quote 72-hr. Connellsville foundry and furnace at $10, high sulphur at $8.45 and stock at $7.40, per net ton, f.o.b. Buffalo.

Chicago—The coke market has exhibited slightly higher prices than last week. Byproduct shippers lack cars. Spot shipments of foundry sizes command premiums. Much higher prices are in prospect. Quotations per net ton, f.o.b. cars Chicago, are as follows:

Connellsville	$9.00 to 9.25
Wise County	9.00 to 9.25
Byproduct foundry	9.25 to 9.50
Byproduct domestic	8.25 to 8.50
Gas house	6.50 to 6.75

St. Louis—Coke advanced this week 50c. on byproduct, making it $5.75 on cars at St. Louis and 75c. on gas coke, making it $5 on cars delivered. The demand for byproduct and gas is exceptionally strong locally on account of no anthracite or smokeless.

Birmingham—The demand for furnace and foundry coke is stiff, with no material increase in production and movement. Sales of spot foundry have been made at $5.50 per ton ovens, and $5 ovens is being quoted by one of the largest foundry-coke producers for contract business for first half of 1917. Furnace coke is bringing around $4 per ton ovens on spot business. All foreign business accepted is conditioned on supply of foreign equipment obtainable.

Middle Western

GENERAL REVIEW

Distress of coal users becoming more acute. Prices reaching new high levels. No improvement in car supply. Western production ranging about 45% of normal output. Steam coals increasingly scarce.

Frantic efforts are being made to relieve the coal shortage in the Western markets. Prices have now reached the same level as prevailed during the anthracite strike of 1902 and are averaging from $1 to $1.50 higher than last week. The situation as a whole is without parallel, and the operators are unable to relieve the tremendous need for tonnage. Difference in size, quality and preparation is disregarded, and stiff bidding occurs whenever buyers hear of a carload of free coal. Quotations on spot coal are now made on an hourly basis.

The demand for steam sizes is unprecedented, and out of all proportion to what usually obtains at this season of the year. The feverish buoyancy in these grades is accentuated by heavy contract demands. Very little smokeless coal is being offered for sale in the West, and it is understood that almost the entire output of the smokeless field is being shipped East.

Stocks of coal are lower than in many years past throughout the Western country. Many re-

tailers having made contracts with the consumers last summer before the present advances are now making deliveries at an actual loss because of their failure to store coal when it could be obtained readily at much lower figures.

CHICAGO

Prices soar to new heights. Receipts not increased. Many storage piles depleted. Eastern coals exceedingly scarce.

The output of the Franklin County mines during the month of October was 1,090,000 tons, as against 989,263 tons for the same month in 1915. The average working time of these mines for seven months to Oct. 30 was 58%, but during October the Franklin County mines operated 75% of full working time. A contract was made this week by a Franklin County operator for 100,000 tons of No. 5 pea at $1 per ton, being an increase of 25c. per ton over the price three months ago.

All domestic sizes from the southern Illinois mines have advanced nearly 50c. per ton due to inadequate car supply. Screenings are averaging $2.75 per ton. As a matter of fact, there is very little Williamson or Franklin County free coal offered in Chicago, and the ability to give immediate shipment is the main factor.

In central Illinois lump, egg and nut are averaging from $3 to $3.50 per ton, and even better. Shipments from the Springfield mines are being made to distant points where this coal has never been known before, and at fancy prices. The tendency is for further advances.

The tremendous increase along manufacturing and industrial lines accounts largely for this phase of the situation, which is intensified by lack of equipment at the mines to meet the steady influx of orders.

All smokeless tonnage reaching the Chicago market is covered by contracts. Here and there a shipment is sold readily at a price of $5 to $5.50 per ton. Retailers advanced the price of smokeless coals over $1 per ton last week, but their storage piles sadly need replenishing. Hocking production is of little consequence in the Chicago market these days, and it is evidently being absorbed at home. Now and then a car of splint is offered, and sold quickly around the $5 mark. Little Kentucky coal is reaching Chicago, and is snapped up at around $5.20 to $5.50 per ton.

Quotations in the Chicago market are as follows, per net ton f.o.b. mines:

	Williamson & Franklin Cos.	Springfield	Carterville	Clinton	Green & Knox Cos.
Lump	$3.00@4.50	$2.75@4.00	$3.50@4.00	$3.00@3.75	$3.00@3.75
Steam lump	.....	2.35@2.50	.....	2.50@2.75	2.50@2.75
2½ and 3-in. lump	.....	.....	.....	.....	.....
1¼-in. lump	.....	.....	.....	.....	.....
Egg	2.75@4.50	2.75@3.75	3.50@4.00	2.75@3.25	3.00@3.25
Nut	2.75@4.00	2.25@3.00	.....	2.25@2.50	2.50
No. 1 washed	3.00@3.75	.....	3.50@4.00	.....	.....
No. 2 washed	2.75@3.50	.....	3.25@3.75	.....	.....
No. 1 nut	2.75@4.50	.....	.....	.....	.....
No. 2 nut	2.50@2.90	.....	.....	.....	.....
Mine-run	2.50@2.75	2.40@2.50	.....	2.25@3.00	2.50@2.75
Screenings	2.25@3.00	2.25@2.50	.....	2.35@2.75	2.25@2.75

	Saline & Harrisburg	E. Kentucky	Pocah. & W. Va. Smokl.
Lump	$2.75@4.50	$3.25@4.75	$6.00
1¼-in. lump	3.00@3.25	.....	.....
Egg	2.75@4.50	3.00@4.50	6.00
Nut	2.75@3.50	2.75@4.50	.....
No. 1 nut	2.75@4.50	.....	.....
No. 2 nut	2.25@3.00	.....	.....
Mine-run	2.50@2.75	.....	5.25@5.50
Screenings	2.25@2.90	.....	.....

ST. LOUIS

A runaway market prevails on everything. Equipment temporarily a trifle easier. Three dollars for Standard lump coal and $4 for Carterville, with Murphysboro Big Muddy at $5 breaks all records. Steam sizes unusually brisk.

The past week has seen the wildest market that St. Louis has ever known. Shippers and jobbers became hysterical and brought about a condition that is not justified and which has seen no parallel in this section at any time in the past.

While a serious car shortage prevails, the past week was not perhaps as bad as the previous week, yet prices went soaring. The demand for St. Louis proper is not as great as in the country and prices in St. Louis are not as high as on coal moving outside.

A careful investigation developes the fact that the jobbing element is largely responsible for the prevailing high prices. Shortage of cars means a shortage of tonnage to contract consumers with the result that the jobbers offered to make up the shortage at higher than contract prices. This they did by offering a premium to the shippers, who held these contracts, thereby cutting down the tonnage available for delivery on contracts and creating an unusually brisk call for spot coal. In one instance twenty cars of Collinsville 6-in. lump sold at $3 at the mine this week for a steam plant in St. Louis.

As high as $4 at the mine is the record for Williamson and Franklin County lump; $3.75 is the top of the market, while consistent shippers are taking care of their regular trade on the open market at from $2.75 to $3. Murphysboro Big Muddy lump is quoted at $5 at the mines. At no time in years has high-grade coal sold for more than $4 delivered to the consumer in St. Louis and this week that price was obtained for the same grade of coal at the mine.

Steam sizes are snapped up daily before the shipper has a chance to say how many cars he has to offer and in many cases before a price is quoted. The car shortage conditions while better this week show no indication of improving in the immediate future. Continued restrictions on the movement of cars to Western and Northern roads are being sent out.

In the prices that make up the local market report, exception must be made for a large tonnage of Williamson-Franklin County and for some Mt. Olive and Staunton domestic coal that is being furnished their regular trade on the open market at a reasonable price, viz: Carterville and Franklin at $2.75 for the domestic sizes and $1.75 for Staunton 3-in. lump and about $2.25 to $2.50 for Mt. Olive 6-in. lump.

The local market f.o.b. mine is about as follows:

	Williamson & Franklin Co.	Mt. Olive	Staunton	Standard
6-in. lump	$3.25@3.75	$3.50	$3.00	$2.50@3.00
6x3-in. egg	3.25@3.75	3.50	3.00	2.50@3.00
3x2-in. nut	3.25@3.75	3.50	2.75	2.25@2.50
No. 2 nut	3.00	3.00	....	2.00
No. 3 nut	2.75	2.75	....	.....
No. 4 nut	2.50	2.75	....	.....
No. 5 nut	2.25	.....	.....	.....
Screenings	2.25@2.50	2.75	2.25	1.50@1.75
2-in. lump	.....	.....	.....	2.00@2.25
3-in. lump	.....	.....	3.00	.....
Steam egg	.....	.....	2.75	1.75@2.00
Mine-run	2.50@2.75	....	2.25	2.00@2.50
Washed				
No. 1	3.25@3.75	3.50	....	2.50@2.75
No. 2	3.00@3.25	3.00	....	2.00@2.25
No. 3	2.75@3.00	2.75	....	.....
No. 4	2.75@3.00	2.75	....	.....
No. 5	2.50@2.75	....	....	.....

The Williamson and Franklin coals take a 72½c. rate to St. Louis and the other grades a 57½c. rate.

KANSAS CITY

Prices up and demand strong. Strike at the Oklahoma mines complicates the situation.

Shipments of coal from the Arkansas Spadra field are coming in fairly prompt. There is a good demand for domestic coal from this field and the supply has been surprisingly good. The mine price of this coal is $4.35; freight, $2.20, and retail price in Kansas City, $9.

The mines in the Arkansas semi-anthracite field have had several small strikes, but this is clearing up now and coal shipments are not so slow. The mine price of this coal is $3.50, the freight, $2.10 and the retail price, $7.25.

General Statistics

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled by 17 principal Middle Western carriers for the month of July, and the first seven months of 1915 and 1916:

	July		7 Months	
	1915	1916	1915	1916
Illinois Central	550,237	630,269	3,996,140	5,054,118
C. & E. I. R.R.	428,653	431,065	3,251,778	4,081,273
C. B. & Q. R.R.	379,912	379,628	2,827,042	3,425,307
C. C. C. & St. L. R.R.	374,728	343,256	2,739,257	3,011,497
Vandalia R.R.	340,926	360,949	2,715,349	2,982,672
C. T. H. & S. E. Ry.	210,978	260,812	1,707,846	2,077,267
C. & A. Ry.	134,567	148,867	1,043,810	1,390,525
Wabash R.R.	114,298	72,837	869,380	896,769
St. L., I. M. & S. Ry.	132,701	113,893	834,083	835,908
Southern Ry.	85,143	115,503	516,769	170,547
B. O. S. & W. R.R.	74,522	47,649	547,996	418,747
St. L., T. & E. R.R.	39,965	62,325	330,967	430,911
St. L. & O. F. Ry.	47,735	53,629	349,713	396,262
L. & M. Ry.	22,382	29,727	265,355	293,901
C. I. & L. Ry.	55,396	64,166	368,612	424,187
C. P. & St. L. Ry.	28,515	21,404	232,107	279,972
C. & N. W. Ry.	26,541	24,908	232,229	294,994

Foreign Markets

GREAT BRITAIN

Coal—Oct. 19—The improvement in the available coal supply reported last week has been maintained, and prices are consequently easing, although there is no great alteration to report.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$10.80@11.04
Best dry coals	10.08@10.20
Best Monmouthshires	10.80@11.04
Seconds	9.60@9.84
Best Cardiff smalls	7.20@7.32
Cargo smalls	5.04@5.28

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The freight market continues to be inactive. There is a great dearth of orders, and only a scarcity of available tonnage prevents a heavy fall. Rates rule about the same level as last reported.

The freight market is quotable about as follows:

Gibraltar	$6.96	Port Said	$14.40
Genoa	15.60	Las Palmas	6.36
Naples	15.60	St. Vincent	7.20
Alexandria	15.00	River Plate	6.96

Exports—British exports for September and the 9 months of the past two years were as follows:

	September		Nine Months	
To	1915	1916	1915	1916
Russia	3,173	.....	38,668	4,804
Sweden	195,722	125,324	2,091,047	1,245,718
Norway	224,461	189,111	2,096,675	1,793,216
Denmark	291,764	160,933	2,522,950	1,784,176
Nethrl	174,996	132,461	1,329,239	945,036
France	1,687,755	1,711,364	13,224,756	13,288,646
Portugal[1]	96,766	65,978	787,422	670,106
Spain[4]	130,270	204,068	1,163,417	1,382,404
Canary	25,283	26,183	388,213	345,714
Italy	558,638	582,863	4,402,998	4,398,057
Greece	6,856	18,645	280,054	129,492
Turkey	.....	.....	10,324	3,219
Algeria	91,738	45,994	726,326	568,915
Portugal[5]	5,405	1,709	150,422	176,494
Chile	271	3,799	38,655	21,505
Brazil	11,951	4,338	424,282	172,666
Uruguay	22,120	908	252,358	157,598
Argentina	132,448	22,599	1,289,440	630,879
Channel Is.	14,840	16,723	100,460	98,284
Gibraltar	27,689	39,405	269,784	368,945
Malta	5,927	6,430	114,494	48,651
Egypt[3]	136,000	48,262	1,080,435	595,389
Aden[3]	5,095	.....	110,889	9,643
India	5,005	254	23,085	9,140
Ceylon	.....	2,960	38,730	25,726
Miscell.	37,860	33,869	459,089	368,954
Coke	108,471	129,799	684,698	1,149,695
Briquettes	96,133	124,587	960,636	1,049,800
Total	4,096,637	3,698,566	35,059,537	31,442,872
Bunker	1,064,967	1,062,707	10,722,894	9,820,906

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

I. C. C. Decisions

No. 8251, W. Harry Brown, vs. Vandalia Railroad. Submitted Apr. 17, 1916. Decided Oct. 3, 1916.

Rates charged by defendants for the transportation of coal in carloads from the north switch connection of complainant's track at Alicia mine, near Brownsville, Penn., with defendant Monongahela Railway Co.'s track to Ashtabula Harbor, Cleveland, Toledo, and Youngstown, Ohio, and Chicago and East St. Louis, Ill., found unduly prejudicial to the extent that they exceed the rates contemporaneously charged by defendants for the transportation of like shipments from the Bridgeport mine of the H. C. Frick Coke Co. to the same destinations. Discrimination ordered removed.